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THE DIAGNOSIS AND TREATMENT OF HYPERTENSION DUE TO UNILATERAL RENAL DISEASE.

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A REVIEW (Kincaid-Smith, 1961*a*) of 326 cases of hypertension due to unilateral renal disease treated surgically in the past four years shows that 40% of these patients are now cured of hypertension by nephrectomy or renal arterial surgery. This represents a striking improvement over the 26% of 575 cases reviewed by Smith in 1956. Over the same period great strides have been made in the medical treatment of hypertension with the introduction of new potent hypotensive agents. Under careful supervision it is now possible to control adequately almost any case of severe hypertension, and the comfort of the therapeutic regime is constantly improving.

This improvement in both the medical and the surgical treatment of hypertension necessitates careful reconsideration of the criteria upon which a decision to operate should be based. The main factor which has improved the prognosis of surgical treatment in the last four years has been the more careful selection of cases (Kincaid-Smith, 1961*a*). The patients most likely to be cured by surgical means are those with a contracted pyelonephritic kidney or major renal arterial occlusive lesions; other unilateral renal abnormalities such as hydronephrosis, calculi, hypernephroma, cysts, tuberculosis and pyonephrosis are unlikely to respond to nephrectomy with a fall in blood pressure (Braasch, 1942; Langley and Platt, 1947; Thompson and Smithwick, 1952; Thompson, 1957; Gelman, 1958; Harris, 1958; Kincaid-Smith, 1961*a*). Surgery should therefore be confined to cases of contracted pyelonephritic kidneys and obstructive renal arterial lesions, and should be avoided in other forms of unilateral disease unless there is a urological indication for nephrectomy or the patient is entirely refractory to medical treatment.

The clinical features and investigations likely to detect potentially curable renal hypertension are discussed, together with the indications for surgery.

DIAGNOSIS.

Clinical Features.

An important feature of renal hypertension is its frequency in patients under the age of 30 years; patients in this age group who have severe hypertension will almost always be found to have a renal cause for it (Platt, 1948; Kincaid-Smith *et alii*, 1958). In patients over the age of 55 years, in whom hypertension arises *de novo* or suddenly increases in severity, athero-thrombotic lesions of the renal artery are often to blame (Page *et alii*, 1959).

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Chronic pyelonephritis is notoriously difficult to diagnose clinically, and the patient with severe pyelonephritic scarring of the ischæmic type may have very little in the history or the urine deposit to suggest pyelonephritis. Other patients with the well-known features of loin pain, rigors, renal colic, frequency, dysuria and pyuria show the same pathological lesions.

The clinical features which should lead one to suspect renal arterial occlusion warrant more detailed consideration as they are less well known. Hypertension in such cases is usually severe; it is often malignant and may be sudden in onset. Acute infarction of the kidney may be associated with severe, unremitting loin pain, hæmaturia, leucocytosis and pyrexia, and at times shock, nausea and vomiting. Polyuria and polydipsia have been noted in patients with renal arterial occlusions (Adams *et alii*, 1951; Howard *et alii*, 1953; Deming, 1954; Margolin *et alii*, 1957); when these symptoms are sudden in onset they are particularly likely to be due to this cause. Leucocytosis, which is characteristic of the acute stage of renal infarction, may persist in the chronic stage (Margolin *et alii*, 1957). Trauma, surgical or otherwise, involving the renal area was the cause of main renal arterial occlusion in six reported cases (Kincaid-Smith, 1961*a*) and should arouse suspicion of an ischæmic renal lesion. The age and sex distribution of patients with renal arterial lesions are fully discussed elsewhere (Kincaid-Smith, 1961*a*). Patients under the age of 40 years are likely to show congenital arterial anomalies. Those over 40 years of age usually show acquired athero-thrombotic lesions of the renal artery. In 45 cases analysed, congenital lesions were twice as common in males as in females, and acquired lesions four times as common in males as in females. Thus the probability of finding a renal arterial cause of hypertension is much higher in male patients. The Leriche syndrome was associated with acquired obstructions of the renal artery in five males and one female. Albuminuria may be of importance in the diagnosis of renal arterial lesions; it is present in over 90% of cases and may be very heavy, with the loss of 15 to 21 grammes of protein daily (Margolin *et alii*, 1957; Poutasse, 1956). It may disappear after nephrectomy (Margolin *et alii*, 1957; Imber and Clymer, 1955; Ullmann *et alii*, 1959). Because of heavy albuminuria the patient may present with nephrotic features, and his disease may be diagnosed clinically as glomerulo-nephritis, as in Ullmann's (1959) case, and in two cases I have seen in which the diagnosis was revealed only at autopsy. A systolic murmur may be heard over the area of the stenosed renal artery (upper abdomen) in a few cases (Peart, 1959).

Investigations.

The two main causes of renal hypertension likely to respond to surgery are unilateral pyelonephritis and renal artery disease. Investigations should therefore be designed to detect these. Atrophic pyelonephritic kidneys are easily detected by pyelography, and in almost all cases in which pyelonephritis has been shown to be the cause of the hypertension the kidney has been small. An autopsy study similarly showed that hypertension occurred in association with contracted pyelonephritic kidneys (Kincaid-Smith, 1955); thus minimal pyelonephritic lesions need not be sought in the hope of curing hypertension by nephrectomy. However, the diagnosis of renal artery disease may be very difficult, and this discussion deals mainly with this problem.

In such a common disorder as hypertension it is not practicable to investigate every patient thoroughly. Patients selected for thorough investigation should therefore be those considered likely on the clinical grounds already discussed to have a renal lesion, or those with severe hypertension resistant to medical treatment.

Radiograph of the Renal Area.

A radiograph to demonstrate the size of the two kidneys is an important simple investigation. Renal outlines should be clearly demonstrated and measured with care. In the large majority of cases of unilateral renal hypertension, a significant disparity is shown in the size of the two kidneys (Dustan and Poutasse, 1959). In the group with unilateral renal artery disease a significant difference in kidney size may be the only clue to the renal lesion, and as such it constitutes an indication for aortography. It is particularly important where shrinkage over a period of time can be demonstrated by comparison with previous radiographs.

It is difficult to find figures giving the normal variation in size of the two kidneys. Measuring kidney lengths in 100 autopsies in persons between the ages of 20 and 50 years, I found very little difference in the two kidneys. This difference did not exceed 1·4 cm., and in only 10 cases was it more than 1 cm., the left kidney being slightly larger than the right. Renal disease, including narrowing of renal arteries, was carefully excluded.

Hodson (1959), in 1200 radiographs of the renal area, found remarkable constancy in the thickness of the renal substance on the two sides; he found also that the total radiographic areas of the two kidneys in an antero-posterior radiograph, measured with a planimeter in square centimetres, is equal to the height of the patient in inches and varies only slightly in patients under 50 years of age. Moell (1956) gives the average radiographic lengths as: right kidney, 12·7 cm. (male) and 12·4 cm. (female); left kidney, 13·2 cm. (male) and 12·8 cm. (female). Thus renal artery disease may be suspected in a hypertensive patient where the kidney lengths differ by more than 1 cm., or where the cortical thickness (measured from the outermost papillæ to the surface) is less on one side than the other. Although differences of more than 1 cm. may occur without renal artery disease, if differences of this magnitude are not investigated by aortography, cases of unilateral arterial disease will be missed. In one patient with malignant hypertension I found a difference of 1·5 cm. in the lengths of the two kidneys, associated with a difference in weight of 73 grammes. The smaller, ischæmic kidney weighed 92 grammes, while the other weighed 165 grammes. Connor *et alii* (1957) report a similar case of hypertension cured by nephrectomy with a difference of only 1 cm. in renal lengths, and a kidney weighing only 63 grammes. Measurement of the width of the renal cortex in such cases gives a better indication of shrinkage of the kidney than does the length.

If there is also shrinkage of the contralateral kidney as compared with the normal for that individual, nephrectomy is contraindicated, but such cases may have bilateral arterial stenosis (Figure I), which may be amenable to vascular surgery (Poutasse *et alii*, 1956).

Pyelography.

Intravenous and retrograde pyelography give further information about the type of renal disease present. If the kidney is not functioning, a retrograde pyelogram, showing normal renal size and calyceal system, is strong evidence of recent arterial occlusion. A unilateral ischæmic kidney may show better concentration of contrast medium than the opposite (normal) kidney when an intravenous pyelogram is taken after a water load.

Although a normal calyceal system is usually found in association with renal arterial occlusion (Margolin *et alii*, 1957; Page *et alii*, 1959), simultaneous demonstration of the renal outline and calyceal system will, in most cases of main renal artery disease, reveal generalized shrinkage of the renal parenchyma. In a small proportion of cases no shrinkage is seen. Occlusion of a branch of the renal artery will show segmental shrinkage of the related renal tissue, whereas chronic pyelonephritis often shows distorted calyces and patchy areas of atrophic renal parenchyma. Occasionally a small pyelonephritic kidney with diffuse involvement has a smooth outline and no calyceal distortion.

The detection of a congenital abnormality of the excretory system, such as a double pelvis or ureter, probably increases the likelihood of an associated congenital arterial abnormality. I have found a reduplication of part or all of the major pelvi-ureteric system (Figure I) in seven of 16 cases with congenital renal arterial lesions and associated ischæmic renal parenchyma. Thus, although double pelves and ureters are comparatively common, their association with congenital arterial anomalies seems higher than can be accounted for by chance association.

Divided Renal Function Studies.

This is the most controversial of all investigations in this field. With the exception of radioactive "Diodrast" studies, they involve bilateral ureteric catheterization and the technical drawbacks of this method. In my experience of 25 cases in whom ureteric catheters have been passed, such difficulties as leakage past catheters, hæmorrhage (which may be profuse) and subsequent urinary infection have been very common. Others mention the same problems (Birchall *et alii*, 1958; Hollander, 1957; Howard, 1956; Stamey, 1959). Theoretically corrections can be applied for leakage by collection of bladder urine, but in practice these may give conflicting results, and most authorities (Howard *et alii*, 1956; Birchall *et alii*, 1958; Schlegel *et alii*, 1959) recommend that results should be discarded where leakage occurs. Reflex anuria, causing the sudden cessation of flow from one or other ureter, is a further difficulty which may interfere with accurate results (Howard *et alii*, 1956; Grabstald, 1951; *The Lancet*, 1958). No reliance can be placed upon renal function tests done within two weeks after aortography because of the severe depression of renal function which often follows this procedure (Birchall *et alii*, 1958).

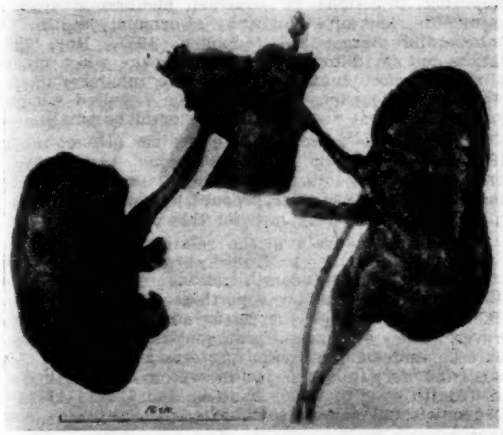

FIGURE I.

Portion of aorta, renal arteries and kidneys from a man, aged 56 years, with malignant hypertension. The renal arteries arose from the aorta above the diaphragmatic crura and ran down at an acute angle through these muscle fibres. Both renal arteries show marked narrowing over a short distance. There is slight post-stenotic dilatation. Thrombotic narrowing was superimposed at the site of stenosis on each side. Note the double ureter on the left. The lower pelvis is hydronephrotic.

Howard's Test.—Howard's test (Connor *et alii*, 1957) compares separately the excretion of sodium and water by the two kidneys. White (1950) observed that sodium and water excretion are markedly reduced in experimental renal arterial narrowing before there is any change in the standard clearances such as inulin, creatinine and para-amino hippurate. The great merit of this investigation over other methods of separate renal function analysis is that not only does it detect an abnormality, but it also gives an indication as to whether nephrectomy is likely to be of any benefit. When the sodium concentration is reduced by 15% or more, and the volume is decreased by 50% or more, on the affected side, removal of the kidney is likely to cure the hypertension (Connor *et alii*, 1957, 1960). The kidneys of patients with a "positive" result from Howard's test, whose hypertension was alleviated by nephrectomy, showed, when examined histologically, widespread partial infarction or ischæmic tubular atrophy resulting either from primary renal arterial disease or chronic pyelonephritis. Kidneys from patients with a "negative" result from Howard's test, who had received no beneficial effect from nephrectomy, showed little or no ischæmic tubular atrophy (Connor *et alii*, 1957). Kidneys with evidence of pyelonephritis associated with the "non-ischæmic" (Kincaid-Smith, 1955) lesion of thyroid-like areas excrete a reduced volume of water, but an equal or increased amount of sodium (Connor *et alii*, 1957, 1960). While this is the most useful divided renal function test at present available for determining the likelihood of a response to nephrectomy, false negative results do occur. I have seen two such cases in which cure of the hypertension by removal of an ischæmic kidney was associated with the excretion of smaller volumes, but almost equal sodium concentrations, from the abnormal kidney, and others record similar results (Stamey, 1959; Birchall *et alii*, 1958; Dunn and Brown, 1958; Schlegel *et alii*, 1959; Shucksmith, 1959; Page *et alii*, 1959). Connor *et alii* (1960) suggest that intravenous infusion of sodium salts during the study may account for these discrepancies. No infusion should be given while this test is in progress.

Divided Renal Clearances.—The use of divided clearances of substances such as inulin, creatinine and para-amino hippurate in the investigation of renal hypertension dates from the work of Chasis and Redisch (1942). The chief disadvantage of such clearance studies in determining the nature or presence of a renal lesion is their lack of specificity (Birchall *et alii*, 1958; Schlegel *et alii*, 1959). They may detect a decrease in function in an abnormal kidney, but, unlike Howard's test, they give no indication of the type of renal lesion present or the likelihood of a response to nephrectomy. Furthermore, as recently shown by Schlegel *et alii* (1959), the relief of a renal artery obstruction by surgery may produce a dramatic alteration in the excreted volume and in the sodium, potassium and ammonia concentrations in the urine from that kidney, without altering the glomerular filtration rate or the renal blood flow. The patient in whom they recorded this was cured of severe hypertension by the operation. This clearly demonstrates that inulin and para-amino hippurate clearances are not specifically altered by the type of ischæmic renal lesion likely to respond to nephrectomy. Ullmann *et alii* (1959) found no significant difference in the creatinine clearances on the two sides in spite of long-standing unilateral ischæmia, shown to be the cause of the hypertension. Luke and Levitan (1959) report a case in which the creatinine clearance was even higher on the side of a renal arterial obstruction. Emphasis should therefore not be placed on differential clearances (inulin, creatinine or para-amino hippurate) as a means of deciding whether to operate in unilateral renal disease, as was advocated by Graber and Shackman (1956). The use of divided clearances to determine the function in the contralateral kidney may still be of use in cases in which nephrectomy is contemplated. The feature which limits their usefulness in this respect is the frequency with which leakage, hæmorrhage and other technical hazards make the results unreliable and difficult to interpret. Some impairment of the function of the contralateral kidney can no longer be accepted as an absolute contraindication to nephrectomy, because of the increasing evidence that improvement in the total renal function usually follows nephrectomy if the hypertension is relieved (Deming, 1954; Imber and Clymer, 1955; Gilfillan *et alii*, 1956; Margolin *et alii*, 1957; Moyer *et alii*, 1958; Ullmann *et alii*, 1959).

Radioactive "Diodrast" Nephrogram.—Winter (1956, 1957) devised an ingenious method of studying the individual "Diodrast" clearance of the two kidneys, namely, the radioactive "Diodrast" nephrogram. It obviates the difficulties and inaccuracies of separate ureteric collections, but has its own technical disadvantages. Winter (1957) and Serrato *et alii* (1959) have reported that this can be a useful screening test in detecting unilateral renal disease. In a series of 12 severely hypertensive patients which I investigated, radioactive renograms were disappointing. Intravenous pyelograms had shown poor function on one side in five cases. Careful attention was given to the details of technique described by Winter, but poor radioactive renogram curves made it difficult to detect even the known abnormality, particularly in three where the lesion was on the right side. This was attributed to the usual

bilateral impairment of renal blood flow in severe hypertension, and to the interference from the "Diodrast" present in the liver on the right side. Good curves were obtained from normal subjects and from normotensive patients with unilateral renal disease.

A recent improvement in technique (Block and Burrows, 1958; Block *et alii*, 1958), which involves blocking the effect of the liver radioactively by a prior injection of non-radioactive carrier "Diodrast", apparently makes it a sensitive and reliable screening method for unilateral renal disease (Block *et alii*, 1958). Even better results are anticipated from the use of radioactive "Hypaque", which is not excreted by the liver (Dennenberg *et alii*, 1960; Winter *et alii*, 1960).

Aortography.

Aortography, a valuable method of investigation, is in danger of falling into disrepute through being used with insufficient care and discretion. The tragic complications of paraplegia (Abeshouse and Tiongson, 1956; Grossman and Kirtley, 1958) and anuria (Alwall *et alii*, 1955; Idbohrn, 1956; Dormandy *et alii*, 1957; McAfee, 1957; Roy, 1957; Kincaid and Davis, 1958) are no less disturbing in the individual case because of their rarity. Selection of cases for aortography is imperative until it is established that improvements in technique and contrast media have reduced the risk to negligible proportions. Aortography should be limited to severely hypertensive young patients, those with clinical features of a renal arterial lesion, those with pyelographic or other evidence of shrinkage or depressed function on one side and those resistant to medical treatment. In cases of hypertension arising after the age of 55 years, aortography is not necessarily indicated in spite of common renal arterial lesions in this group. Surgical risks are high in such patients (Page *et alii*, 1959), and unless operation is contemplated no advantage can be gained from aortography.

The risks of aortography are difficult to assess because of the variations in methods used. A recent survey of the over-all complications of aortography in the United States of America revealed a 0·28% mortality and a serious complication rate of 0·74% (McAfee, 1957). However, there are reports of 1000 aortograms in a single centre without any fatality and with few serious complications (Kincaid and Davis, 1958). Renal damage short of renal failure has been found after aortography by different observers in 4% to 35% of cases (Edling and Helander, 1957; McAfee, 1957; Szilagyi *et alii*, 1956).

There is considerable clinical and experimental evidence that high concentrations of contrast medium reaching the kidney or spinal cord increase the risks of injury (Beall *et alii*, 1958; Dormandy *et alii*, 1957; Hol and Skjerven, 1954; Idbohrn and Berg, 1954; Idbohrn, 1956; Kincaid and Davis, 1958; McAfee, 1957). The smallest amount which will give adequate definition of the renal arterial system should therefore be used. Poutasse (Page *et alii*, 1959) has devised a method using "Arfonad", which permits adequate visualization of the renal vasculature with only 10 ml. of contrast medium.

There is some evidence (McAfee, 1957; Lindgren, 1958; Szilagyi *et alii*, 1959; Killin *et alii*, 1959) that certain contrast media such as "Hypaque" (sodium-3,5-diacetamido-2,4,6-tri-iodobenzoate) and "Neo-iopax" (disodium 1:4-di-iodo-1-methyl-4-oxopyridine-2:6-dicarboxylate) are less likely to cause serious complications than others such as "Diodrast" (iodopyracet-3,5-diodo-4-pyridone-N-acetic acid diethenolamine) and "Urokon" (sodium-2,4,6-triiodoacetyl-amino benzoate). However, complications, and even death, do occur with "Hypaque" and "Neo-iopax" (Josselson and Kaplan, 1954; Abrahms, 1957), and because of great individual variation it is wise to use any contrast medium with care and in small quantities. Birchall *et alii* (1958) and Szilagyi *et alii* (1959) record depression of renal function, sometimes severe, following aortography with "Hypaque".

The severe renal damage which follows the injection of contrast medium directly into the renal artery (Beall *et alii*, 1958; Josselson and Kaplan, 1954; Kincaid and Davis, 1958; McAfee, 1957) demands that precautions should be taken against this technical error which caused one-third of 39 serious complications recorded by McAfee (1957). There is little, if any, clinical justification for injecting contrast medium directly into the renal artery in renal hypertension; but if this method is used, very small amounts and low concentrations should be employed, because the usual dilution by aortic blood does not occur. Aortography should not directly precede or follow any major surgery because in either case it may produce temporary renal damage. Depression of renal function may persist for two weeks after aortography, and it would be unwise to undertake any major operation during this period (McAfee, 1957; Szilagyi *et alii*, 1959). Renal function tests at this stage are obviously also unreliable (Birchall *et alii*, 1959).

A raised blood-urea level is a contraindication to aortography (Alwall *et alii*, 1955; Idbohrn, 1956; Kincaid and Davis, 1958), and as nephrectomy would not be contemplated in its presence it would be of little value. I disagree with Edling and Helander (1957), who maintain that cases with evidence of any "renal damage" should be excluded as this would exclude many reported cases with proteinuria in which aortography led to detection and cure of renal hypertension.

Repeated injections of contrast medium undoubtedly increase the risks of aortography (Dormandy *et alii*, 1957; Idbohrn and Berg, 1954; Idbohrn, 1957; Roy, 1957); amounts too small to produce any damage when given as a single injection may produce severe tubular damage if repeated. Aortography should not be repeated within 10 days, and if a test dose is used it should be small.

The intraaortic injection of procaine (Huger *et alii*, 1958) has been shown to protect against both renal and neurological damage from aortography in dogs, and it is probable that some similar preparation, which is safe for clinical use, will be developed for this purpose.

It is difficult to evaluate the relative merits and risks of translumbar and retrograde aortography (Seldinger, 1953). Some complications, such as dissection (Gayliss and Laws, 1956) and retroperitoneal hæmorrhage, are unlikely to occur when the retrograde technique is used; however, the strongest protagonists of aortography (Poutasse and Dustan, 1957) perform translumbar aortograms, and very large series in which this method was used (Smith *et alii*, 1952; Kincaid and Davis, 1958) are recorded without serious mishap.

Aortography is the only method of detecting bilateral ischæmic lesions (Dustan and Poutasse, 1959) which may be operable (Poutasse *et alii*, 1956). High-quality aortograms will demonstrate occlusions in major renal artery branches, and even multiple small occlusions with associated areas of ischæmic renal parenchyma (Smith, Rush and Evans, 1951).

Renal Biopsy.

Renal biopsy as a method of investigation has a limited use in unilateral renal disease. Biopsy of the affected kidney may show the histological lesion of partial infarction, or ischæmic tubular atrophy, which has been shown to be causally related to hypertension (Connor *et alii*, 1957).

Biopsy of the contralateral kidney is useful if it shows a lesion which contraindicates nephrectomy. In one such patient, a young man with malignant hypertension and a contracted pyelonephritic kidney on one side, the detection of minimal amyloid disease in the large contralateral kidney averted nephrectomy. The commonest lesion in the contralateral kidney which would militate against nephrectomy is the irreversible narrowing of interlobular arteries resulting from malignant hypertension. The fibrinoid changes in this condition are reversible, but interlobular narrowing does not disappear when the blood pressure is lowered; the cellular intimal tissue merely becomes fibrous (Harington *et alii*, 1959). I consider that such narrowing constitutes a contraindication to nephrectomy, because the secondary areas of partial infarction found distal to such vessels (Kincaid-Smith *et alii*, 1958) will maintain the blood pressure at a high level after operation.

In experienced hands the risks of renal biopsy are slight (Arnold and Spargo, 1959; Brun and Raaschou, 1958). The only complication which I have encountered in 100 biopsies has been hæmaturia of 36 hours' duration in one case in which transfusion was not required (Kincaid-Smith, 1961*b*).

Tetraethyl Ammonium Chloride.

Brust and Ferris (1957) give a rapid intravenous injection of 400 mg. of tetraethyl ammonium chloride in patients with suspected renal hypertension. They claim that this produces a blood-pressure drop in patients with unilateral renal disease unlikely to respond to nephrectomy, whereas no such drop occurs in those with occlusive vascular renal lesions, which are likely to respond to nephrectomy. This observation has not as yet been confirmed by other investigators, but may prove valuable.

Inspection at Operation.

The final decision about nephrectomy or arterial surgery must sometimes be made in the operating theatre. Aortography may show an apparent narrowing in a renal artery, but when this cannot be demonstrated at operation, and there is no thrill or pressure gradient across the affected portion of vessel, it would be unwise to proceed with nephrectomy (De Camp, 1958; Peart, 1959) unless there are other indications.

The renal lesions associated with large areas of ischæmic parenchyma have a characteristic macroscopic appearance (Kincaid-Smith, 1955, 1961*a*), and if clinical investigation has proved inconclusive, or if partial nephrectomy is contemplated, further information can be obtained from inspection of the kidney.

The presence of the surface nodularity of malignant nephrosclerosis indicates irreversible well-marked interlobular artery narrowing (Kincaid-Smith *et alii*, 1958), and if this is present in the contralateral kidney, it is a contraindication to nephrectomy.

Treatment.

Even when a probable unilateral nephrogenic cause of hypertension is demonstrated, surgery may not be indicated if a good hypotensive response to a comfortable medical regime can be achieved.

The optimum chance of response to surgical treatment is 40%, and this must be weighed against operative risks, which are high, particularly in older patients. Page *et alii* (1959) record 59 cases treated surgically with an over-all operative mortality of 8·5%, which is brought up to 18·6% by late post-operative deaths. Most deaths occurred in older patients and were due to cerebral or coronary vascular disease. One death resulted from hæmorrhage from the arterial graft.

In young patients with severe hypertension, a 40% chance of cure by operation may be preferable to a lifetime of medical treatment, in spite of surgical risks. Vascular surgery with preservation of functioning renal parenchyma is clearly the method of choice where feasible.

It may be technically difficult to excise and repair narrowed segments of the renal artery. Spleno-renal anastomosis is often possible if the left renal artery is diseased. Endarterectomy may be adequate where the lesion is athero-thrombotic. Where occlusive lesions occur at the orifice of, or in the proximal portion of, the renal artery, a segmental aortic graft with bypass to the distal renal arteries has to be considered (Humphries and Poutasse, 1957). Surgery is certainly not without hazard and difficulty, and the best method of correction for each case must be decided with care. Renal endarterectomy and nephrectomy are the simplest procedures. Nephrectomy is indicated if the general condition of the patient is poor, or if there is much ischæmic atrophy in the kidney.

The value of partial nephrectomy in segmental unilateral lesions has yet to be demonstrated. Page *et alii* (1959) record six cases so treated, but individual results in these cases are not given. A transverse hemi-nephrectomy seems preferable to the conventional wedge method, because of the large area of ischæmic tissue which results from the latter procedure (Murphy and Best, 1957).

Discussion.

In a recent editorial (*The Lancet*, 1960) it was stated that there can be few more difficult problems in practical medicine today than the decision about the treatment of a case of suspected renal hypertension. The clinical evaluation of the advisability of nephrectomy in cases of unilateral renal disease and hypertension has been influenced in recent years by two main factors. Although the increasing success and comfort of medical treatment for hypertension have decreased the need for surgery, a far greater number of cases of renal hypertension have been discovered as a result of newer diagnostic techniques. Most of the recent cases have been of primary renal arterial lesions and, in many, intravenous pyelograms have shown good concentration on both sides; these patients would formerly have been labelled essential hypertensives. In such patients a relatively good prognosis for cure by nephrectomy is counterbalanced by the necessary sacrifice of a large amount of functioning renal tissue. Erroneous removal of a kidney may not only fail to relieve the hypertension, but may aggravate it (Wilson and Byrom, 1941; *The Lancet*, 1960). However, vascular surgery now makes it possible to correct the arterial abnormality in some of these cases without loss of renal tissue, but operative risks may be high (Page *et alii*, 1959).

The vast majority of cases of unilateral renal hypertension recorded over the past four years showed renal arterial lesions or contracted chronic pyelonephritic kidneys (Kincaid-Smith, 1960*a*), both of which have a relatively good prognosis if treated surgically.

The incidence of renal hypertension amenable to surgical treatment is probably higher than was previously supposed. Braasch (1942) estimated that less than 1% of cases of hypertension were likely to show a renal cause, whereas Page *et alii* (1959) demonstrated renal arterial lesions in 27% of 317 selected hypertensive patients in whom aortograms were performed. In over 50% of those treated surgically the causal relationship was demonstrated by cure of the hypertension. Even in an autopsy study the number of cases of obstructive renal artery disease increases where it is specifically sought. Thus, in 3% of 124 cases of malignant hypertension, obstructive renal arterial lesions (Kincaid-Smith *et alii*, 1958) were discovered by routine examination, whereas in 19% of 42 further cases of malignant hypertension, this lesion (Harington *et alii*, 1959) was demonstrated when most kidneys were examined personally, and even this figure is probably an underestimate because only arteries with complete occlusion or marked narrowing were included as probably causal.

When nephrectomy is contemplated, it is important to determine, if possible, whether irreversible changes in the other kidney will prevent a fall in the blood pressure. Graber and Shackman (1956) attempted to distinguish such cases on the basis of divided renal clearances. However, the changes which they attributed to irreversible hypertensive disease are non-specific (Birchall, 1958; Maluf, 1957; Michie and Michie, 1957; Michie *et alii*, 1957). Patients with renal arterial lesions and depression of glomerular filtration rate and renal plasma flow, similar to those which Graber and Shackman (1956) regarded as inoperable, have shown improvement in renal clearances after nephrectomy, or even after medical treatment of their hypertension (Moyer *et alii*, 1958). The fact that creatinine clearances may be equal (Ullmann *et alii*, 1959) or even higher on the abnormal side (Luke and Levitan, 1959) in cases cured by nephrectomy provides an even more cogent argument against placing too much reliance on divided renal clearances.

Of divided renal function studies at present available the radioactive "Diodrast" screening test of Winter (1957) and the more specific sodium and water excretion test known as Howard's test (Connor *et alii*, 1957, 1960) are the two most useful in clinical work. Much attention is being paid to this subject and progress is being made towards finding a specific type of functional pattern which should simplify detection of unilateral renal disease causing hypertension (Birchall *et alii*, 1958; Schlegel *et alii*, 1959;

Stamey, 1959; Connor *et alii*, 1960). At present a low urine volume with high osmolarity, low sodium and high potassium and ammonia concentrations on one side seems to indicate the presence of an ischæmic renal lesion likely to respond to nephrectomy.

The histological lesion which is likely to prevent response to surgery is that of areas of partial infarction distal to narrowed interlobular arteries in malignant hypertension. Many cases of malignant hypertension have been cured by nephrectomy, but only a percentage of patients with this disorder show interlobular narrowing (Kincaid-Smith *et alii*, 1958). Thompson and Smithwick (1952) have shown that the severe arterial and arterioiar lesions of benign hypertension do not preclude a successful response to nephrectomy. In such cases interlobular arteries are not significantly narrowed and no ischæmic changes occur in related areas of parenchyma.

The incidence of a congenital abnormality in the distribution and supply of renal arteries in the patients under 40 years of age with obstructive arterial lesions causing hypertension is remarkably high (Kincaid-Smith, 1961*a*). De Camp and Birchall (1958) noted that patients with a duplicated renal artery often have an associated thrombosis or stenosis. Such vessels, and other congenitally abnormal vessels, are probably subject to unusual hæmodynamic and external stresses, which may well predispose to an associated atheromatous or thrombotic occlusion. The high association of the two types of lesion suggests that this is so. It is interesting to note that Marshall (1951) found that the incidence of aberrant arteries was significantly higher in hypertensive than in normotensive subjects. In the case illustrated in Figure I, the renal arteries arising deep to the crura of the diaphragm and running down at an unusually acute angle were undoubtedly subject to unusual stresses, and both showed atherothrombotic occlusive lesions in addition to the congenital anomaly. The latter seemed more important in the genesis of the malignant hypertension, which presented only at the age of 56 years. There is also a high incidence of pelvic and ureteric congenital anomalies in patients with arterial occlusions and these may be included as a further indication for aortography in cases of hypertension.

Long-standing hypertension often responds to surgical treatment. Langley and Platt (1947) emphasized this, and their contention has been supported by many other authors (Sensenbach, 1944; Kilman *et alii*, 1949; Schaffer and Markowitz, 1954; Poutasse, 1956; Parton and Nabseth, 1958; Harris, 1958; Welch *et alii*, 1958; Ullmann *et alii*, 1959). In five of the cases discussed by Schaffer and Markowitz (1954) the hypertension was cured, in spite of having been present for 20 to 23 years. Page *et alii* (1959) found that the blood pressure had been raised for over two years in 62% of their cases of obstructive lesions of the renal artery; a high proportion of these patients were cured by surgical treatment.

A few clinical features warrant discussion. The heavy proteinuria in a child, aged two years, recorded by Ullmann (1959), led to the erroneous diagnosis of chronic glomerulonephritis. Hypertension and albuminuria persisted, but aortography 10 years later revealed a stenosis of the right renal artery. Nephrectomy cured both the hypertension and the proteinuria. Proteinuria is almost always present in cases with occlusive renal arterial lesions, and may be as high as 21 grammes in 24 hours (Margolin, 1957; Poutasse, 1956). The incorrect diagnosis of glomerulonephritis or some other cause of the nephrotic syndrome is clearly a risk in such cases.

Polyuria has been noted as an accompaniment of hypertension resulting from unilateral renal ischæmia (Deming, 1954; Margolin *et alii*, 1957; Snyder *et alii*, 1955). It is cured by nephrectomy and has been thought to be due to circulating renin. I have seen one patient who presented with polyuria and a serum potassium level of 2·0 mEq/l., in whom the polyuria was probably due to the impaired concentrating power resulting from marked hypokalæmia (Milne *et alii*, 1957). The polyuria decreased when the patient was given potassium supplements, and disappeared after nephrectomy (Dollery *et alii*, 1959); this suggests that the hypokalæmia was due to potassium loss from the ischæmic kidney.

A lower motor neuron facial palsy has been described in two cases (De Camp and Birchall, 1958; Ullmann, 1959) and I have seen a further two cases. All occurred in severely hypertensive male children under the age of 12 years with unilateral renal arterial occlusions. The association between this neurological manifestation and malignant hypertension unrelated to a renal arterial cause has also been noted (Kincaid-Smith *et alii*, 1958), but its occurrence in four such similar cases seems worthy of comment.

Conclusions.

For the practising physician who is daily confronted with new cases of hypertension some guide to their investigation and treatment in relation to the problem of unilateral renal disease may be helpful.

Cases which Should be Investigated for a Correctable Renal Cause.

Cases which should be investigated for a correctable renal cause include: (i) those in patients under 40 years of age; (ii) those of severe (malignant or pre-malignant) hypertension, particularly when the onset is sudden; (iii) those with the clinical features enumerated above which suggest pyelonephritis or renal arterial lesions (the latter are more frequent in males). Before undertaking full investigation of patients over 55 years of age, even if a renal cause is very likely, the chances of surgical cure (40%) must be weighed against the high operative and post-operative mortality. When the blood-urea level is elevated above 60 mg.% it is unlikely that surgery would be undertaken, and thus detailed investigation is not indicated. Aortography is dangerous in these cases, and, unless there is strong reason to suspect the rare bilateral arterial occlusion, medical treatment is the method of choice.

Investigations which Should be Done.

Intravenous Pyelogram.

A high standard of definition should be demanded when intravenous pyelography is undertaken. If the renal lengths and cortical thicknesses are equal and normal, only those cases with other clinical indications of a renal arterial lesion, or with hypertension refractory to medical treatment, should be investigated further. Retrograde pyelography (to demonstrate renal size) may be indicated if there is no excretion on one side.

Divided Renal Function Studies.

Howard's Test.—Howard's test is the best test of function at present available for the diagnosis of ischæmic renal lesions (pyelonephritic or primary arterial), and for the prediction of their response to nephrectomy.

Radioactive "Diodrast" (or "Hypaque").—A nephrogram, done with the aid of "Diodrast" or "Hypaque", is a useful screening test for unilateral renal disease.

Divided Renal Clearances (Inulin, Creatinine and Para-amino Hippurate).—Divided renal clearance tests are of little use in diagnosis, and often give conflicting results. If nephrectomy is contemplated they may be useful to determine the function of the contralateral kidney, but because of technical difficulties they may be unreliable for this purpose.

Aortography.

Aortography is the best single test in hypertension arising from renal artery lesions, and the only means of detecting bilateral arterial lesions. It is not without risk, should not be repeated in less than 10 days and is contraindicated if the blood-urea level is elevated.

Renal Biopsy.

Renal biopsy is indicated in selected cases; this has been discussed already.

Indications for Surgery and the Choice of Surgical Method.

Surgery is indicated in the case of patients under 50 years of age who have severe hypertension and major renal arterial lesions, or a small pyelonephritic kidney. When other unilateral renal lesions are present, nephrectomy should be done on urological indications only, or as a last resort if medical treatment fails. Functioning renal tissue should be preserved wherever possible; nephrectomy which does not relieve hypertension may accelerate deterioration. The type of surgery required should be carefully considered in each case; nephrectomy is simple, and corrective vascular surgery may be technically difficult and involve greater operative and post-operative hazards. Patients over 55 years of age should probably be treated medically because of their high post-operative mortality.

SUMMARY.

1. The prognosis for the cure of hypertension arising from unilateral renal disease by nephrectomy or renal arterial surgery as judged by published reports in the past four years is about 40% of the cases operated upon. This improvement over previous results (26% in 1956) is largely due to more careful selection of cases for surgery. Small, pyelonephritic kidneys and renal artery disease are the lesions most frequently found in successful cases.

2. The clinical features which suggest the diagnosis of renal hypertension arising from pyelonephritis or renal artery disease are discussed.

3. Renal artery disease in patients below the age of 40 years is almost always associated with a congenital arterial lesion, whereas in patients over this age it is usually due to acquired atheroma and thrombosis.

4. Radiographic estimation of renal size, intravenous pyelography, divided renal function studies, aortography and renal biopsy may all help in the diagnosis and the assessment of renal hypertension amenable to surgery. The relative value of these investigations is discussed.

5. Even where unilateral pyelonephritis or renal artery disease is discovered, it may be advisable to treat the patient with hypotensive drugs, rather than by operation. Surgical risks are high, particularly in older patients, and the optimum chance of curing the hypertension is only 40%. Surgical treatment may be the method of choice in young patients with severe hypertension, even if response to medical treatment is satisfactory. In the rare cases refractory to medical treatment it may offer the only hope of relieving the hypertension.

6. Hypertension of long duration may respond well to nephrectomy or to arterial surgery.

7. A heavy albuminuria (up to 21 grammes per 24 hours) may be present in cases with curable renal artery disease, and may lead to a misdiagnosis of glomerulonephritis.

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SOME HAZARDS OF MODERN THERAPY.[1]

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THIS subject is a segment of "iatrogenic" disease, a misnomer meaning "giving birth to physicians". The field could once be discussed under the general heading of "skin rashes and blood dyscrasia", but has now been elevated to occupy a separate chapter in many texts under the heading "diseases of medical progress". Collectively we may deplore this, and individually feel a little guilty when it affects one of our patients — a guilt which we tend to project into a condemnation of the drug houses. The field is very large, but under the present title one may exclude such hazards as misinterpreted laboratory, cardiographic and radiographic signs, the hazards of faulty diagnosis and prognosis, and the effect of the doctor's psyche on the patient's soma. Certain hazards which are not relevant to this occasion include those exclusive to other specialties, calculated hazards in the therapy of fatal diseases, older hazards such as arise from addiction, irradiation, transfusion, communal hazards such as arise in the search for civil tranquillity, in the use of aspirin almost as part of the national diet, and in the emergence of drug-resistant pathogens. It is my own preference to exclude drug rashes. One may compile long lists of possible rashes and the drugs which cause them, but they are not relevant to this theme except in those cases in which a rash may signify more serious underlying disease.

This paper is confined to an acceptable nomenclature, and to those hazards which have been recently recognized or understood or have thrown new light into dark corners of medicine. Barr, in an analysis of the incidence of serious drug reaction in a large hospital, has recorded

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on November 5, 1960, at Canberra.

approximately 50 cases per 1000 admissions. In 1957 a symposium on "Sensitivity Reactions to Drugs", under the chairmanship of Professor M. L. Rosenheim, was organized by the Council for International Organization of Medical Sciences. This symposium included a session on nomenclature, because of the lack of general agreement on terminology. The classification generally accepted at that time has been followed.

Overdosage.

Overdosage is seen, apart from clinical error, largely when patients undertake their own treatment. There are many reports of the results of hypervitaminosis A, the vitamin usually having been taken in the optimistic treatment of respiratory infections and ichthyosis. The anæmia, renal failure and hypercalcæmia of hypervitaminosis D may present a puzzling picture not unlike hyperparathyroidism. Under this heading may be mentioned overdosage with "Artane" in the treatment of Parkinsonism, in which the belladonna-like effects on old patients may present as confusion, disorientation and vertigo, particularly at night and particularly in summer.

Overdosage may result from accumulation, and is well recognized with digitalis therapy, although too much attention is paid to pulsus bigeminus. It may be indicated by other arrhythmias — multifocal extrasystoles, atrioventricular block, tachycardia — and occasionally by intractable congestive cardiac failure. In a recent large series the most common toxic dose of digoxin was 0·5 mg. Cumulative overdosage may occur with "Butazolidin", a drug which is not excreted and is only slowly metabolized in the body. A daily dosage over 200 mg. of this drug would saturate its protein-bound form at about 10 mg. per 100 ml., the remainder existing in a free and perhaps more toxic form. Relative overdosage may result from an underlying abnormality of the patient. Perhaps the most serious example is streptomycin, which in high concentration damages the vestibular nerve. This drug should not ordinarily be used in the treatment of elderly patients, or of those with an elevated blood urea level. The occurrence of anuria in a patient receiving streptomycin is an indication for use of the artificial kidney. The related antibiotic, dihydrostreptomycin, specifically damages the auditory nerve and should not be used. A further example of relative overdosage concerns the heightened toxicity of digitalis in the presence of hypokalæmia, which is commonly induced by some diuretics — for example, chlorothiazide.

Intolerance.

Intolerance reflects a lowered threshold to normal pharmacological actions. The most obvious example concerns the wide range of tolerance and response to alcohol. It has been commented that of five men with the same intake of alcohol, one may be apparently unaffected, one may become talkative, one may want to fight, one may want to sleep, one may want to make advances to the barmaid. This range of biological variation is reflected in other less effective and more expensive tranquillizers. Intolerance is seen in cinchonism following very small doses of quinine, in ptyalism following very small doses of iodides, and in acute salicylism in children. The last-mentioned was rarely recorded until Coburn recommended high dosage in rheumatic fever. Many children who take more than 0·5 grain of aspirin per pound of body weight per day develop hyperpnœa, respiratory alkalosis and hyperchloræmic acidosis.

Idiosyncrasy.

Idiosyncrasy is due to a constitutional defect in the patient. Hæmolytic anæmia is a rare result of drug therapy, although common in children who swallow mothballs. It is, however, common in Negroes who take "Primaquin" for malaria. A number of ethnic groups have an inborn deficiency of the enzyme glucose-6-phosphate dehydrogenase, which by maintaining glutathione in a reduced form permits the normal glycolytic metabolism of the mature red blood cell. This deficiency may be reflected by hæmolysis under challenge by various drugs. It is thought to explain the hæmolysis in approximately 13% of Negroes who take "Primaquin", and the hæmolytic anæmia which follows the eating of the common broad bean, *Vicia fava*, by the dark-skinned, oriental Sephardic Jews. Hæmolytic disease, without anæmia, may follow the use of a number of other drugs — phenacetin, aspirin, sulphafurazole — and is thought to arise from this mechanism in constitutionally "sensitive" patients. Of more importance in relation to phenacetin is the high incidence of interstitial nephritis, with necrotizing papillitis, in patients taking more than 12 grains of phenacetin per day. These patients may present themselves with renal failure which may be reversible. In this case the cause is not idiosyncrasy, but a toxic impurity in phenacetin produced throughout the world to supply the universal demand for "A.P.C.".

Patients with porphyria cutanea tarda and acute intermittent porphyria may be precipitated into an acute exacerbation by the administration of barbiturates. These drugs may act by exaggerating a latent enzymatic defect in hæm-metabolism.

Side Effects.

The term "side effects" should be confined to those undesirable but unavoidable effects of drugs which are part of their normal pharmacological action. They are typified by the well-known side effect of the ganglion-blocking drugs. Some may be exaggerated by the concurrent use of other drugs; for example, the hypokalæmia caused by chlorothiazide may contribute to the intestinal ileus occasionally caused by mecamylamine. Last summer's extreme heat in Sydney provoked "heat stroke" in a number of hypertensive elderly patients whose regimen included salt restriction, diuretics and hypotensive agents. Under this heading there should be included side effects due to metabolic competition. There has recently been described the occurrence of megaloblastic anæmia following the prolonged use of "Dilantin". This appears to be due to folic acid antagonism; the anæmia responds promptly to the administration of folic acid, and "Dilantin" therapy need not be suspended. Similarly, niacin may interfere with the metabolism of pyridoxine, and the peripheral neuritis following the prolonged use of isoniazid may be due to a competitive deficiency of pyridoxine, although its response to this vitamin is not impressive. The actions of the phenothiazine group of drugs are so wide that one, chlorpromazine, is said to consist almost entirely of side effects, perhaps reflected in its trade name "Largactil". It has anti-adrenaline, local anæsthetic, antipyretic, atropine-like, weak ganglion-blocking, antihistaminic and quinidine-like effects. It abolishes tetanus and conditioned reflexes, and in large doses induces a Parkinsonian state. It is a powerful antiemetic and potentiates barbiturates. Perhaps the greatest hazard in this group of drugs lies most in their very profusion, which tends to defeat even a broad pharmacological classification. The following classification is already out of date:

Tranquillizers.

1. Phenothiazine nucleus: (i) Aliphatic "tail" — chlorpromazine ("Largactil", "Amphactil"), promazine ("Sparine", "Prozine"), triflupromazine ("Siquil"). (ii) Piperadine "tail" — mepazine ("Pacatal"), thioridizine ("Melleril"). (iii) Piperazine "tail" — prochlorperazine ("Stemitil"), trifluperazine ("Stelazine"), perphenazine ("Trilafon"), fluphenazine ("Sevinol"), thiopropazate ("Dartalan"), pipamazine ("Mornidine").

2. Rauwolfia alkaloids: reserpine ("Serpasil"), deserpidine ("Harmonyl"), 10 methoxy-deserpidine ("Decaserpyl"), rescinnamine ("Moderil"), syrosingapine ("Singoserp").

3. Diphenylmethane group: hydroxyzine ("Atarax"), diphenylhydramine ("Benadryl"), benactyzine ("Karmazine"), azocyclonal ("Frenquel").

4. Glycerol derivatives: mephenesin ("Tolserol", "Soma"), meprobamate ("Miltown", "Equanil"), phenaglycodol ("Ultran", "Acalo"), methylpentynol ("Oblivon").

Antidepressant Drugs.

1. Hydrazine derivatives: iproniazide ("Marsilid"), phenelzine ("Nardil"), nialamide ("Niamid"), phenylpropylhydrazide ("Cavodil"), isocarboxazide ("Marplan").
2. Imipramines: "Tofranil".
3. Unclassified: pipradol ("Meratran", "Deaner"), methylphenidate ("Ritalin").

Side effects include histamine release. Histamine may be released from tissue cells in allergic reactions; but some drugs may release histamine without any allergic or sensitizing action. Substances such as "48/80" are used experimentally for this purpose; but a minor anaphylactoid reaction due to histamine release may follow the intravenous use of a number of drugs, including atropine, morphine, papaverine and "Priscol", with itching, flushing and transient urticaria. This action may be particularly relevant in patients with asthma who have become "adrenaline-fast"—large doses of adrenaline may, in fact, result in histamine release.

The physiological side effects of steroids are well known, but perhaps disproportionately noted. Glycosuria, hypertension and "moon face" are relatively innocuous. Serious side effects include osteoporosis and the danger of vertebral collapse in post-menopausal women, the activation of an apparently healed tuberculous focus, the precipitation of acute perforating peptic ulceration, and the danger of post-operative shock up to 12 months after cessation of a course of steroids, long after this has been forgotten by both patient and doctor. Some steroids have their own specific side effects—for example, red face and symmetrical muscle wasting accompanying triamcinolone. It should be remembered that the bovine protein content of ACTH has resulted in anaphylactic death, and that in an Australian summer the administration of steroids, by suppressing melanocyte-stimulating hormone, may result in serious sunburn. Under this heading should be included the syndrome of hypercalcæmia and renal failure, without calciuria, which may follow prolonged use of milk and absorbable alkali in the treatment of peptic ulceration. Distinction between this syndrome and primary or secondary hyperparathyroidism may be very difficult. One should include "carbon dioxide narcosis". This syndrome is seen in patients with long-established hypercapnia due to bronchitic emphysema. Their respiratory centre, tolerant to high carbon-dioxide levels, depends for respiratory drive on oxygen chemoreceptors in the carotid vessels. Drugs which depress the respiratory centre, such as pethidine and morphine, or the modern efficient oxygen masks, may depress the remaining respiratory stimulus, and the patient may develop increasing hypercapnia, cerebral œdema and coma. Some side effects are still not understood. These include gynæcomastia following digitalis therapy, myxœdema following prolonged use of resorcin ointment, and goitre following the use of cobalt in children. It is difficult to classify such side effects as the corneal opacities being found now in patients treated with chloroquine for rheumatoid arthritis. These opacities are a threat to the patient's vision, but are reversible if they are recognized early and if the drug is suspended.

Secondary Effects.

Secondary effects are the indirect results of a successful therapeutic action. They include the proliferation of monilial infection due to suppression of normal flora by antibiotics, vitamin deficiencies in children from the same cause, and the exacerbation of acute gout which may follow either the mobilization of uric acid crystalline stores by probenecid or successful diuresis following chlorothiazide. Perhaps the most interesting has been the precipitation of hepatic coma by chlorothiazide, particularly in those cirrhotic patients who have the most copious diuresis. The mechanism may lie in the inhibition of carbonic anhydrase, which may be effectively diuretic by preventing the ionic exchange in the tubules of sodium by hydrogen ions. Indirectly, the absence of hydrogen ion may prevent the excretion of ammonium ion, whose accumulation in the blood parallels the depth of hepatic coma. The blood ammonia level may rise as a result of the administration of ammonium chloride, "Diamox", ammonium exchange resins and protein-rich diets, and blood feeding after gastro-intestinal hæmorrhage. In the patient with pernicious anæmia, folic acid permits the incorporation of uracil into desoxyribonucleic acid and may abolish the megaloblastosis and glossitis. The secondary effect of folic acid is to deprive cells of uracil required for ribonucleic acid of protoplasm, particularly that of the long axons of the spinal cord, and these patients cured of their anæmia may present with an acute onset of subacute combined degeneration of the cord.

Allergy and Hypersensitivity.

Allergy and hypersensitivity are the effects conditioned by previous exposure and mediated through an antigen-antibody reaction. Some drugs appear to alter particularly circulating cells in the blood, so that the normal "self" recognition system is perverted, with the production of antibodies against that cell series. The most closely studied has been the role of "Sedormid" in the production of thrombocytopenic purpura. In some patients this drug appears to act as a haptene in the presence of platelets with the production of antiplatelet antibodies. These antibodies, in the presence of complement and "Sedormid", will lyse not only the patient's but any other human platelets. A similar haptene antigenicity is thought responsible for the hæmolytic crises in patients taking quinine and for the neutropenia which follows sulphapyridine. When all elements of the marrow are damaged — for example, in chloramphenicol pancytopenia — this may be a direct toxic effect on the marrow; but there remains the possibility of a related antigen-antibody reaction affecting totipotent marrow cells. Drug allergy may be of the classical "immediate" type, with the production of circulating non-precipitating sensitizing antibody. This has been amply shown by Halpern in a series of immunological experiments on a volunteer patient known to respond with anaphylactic shock to amidopyrine. This mechanism is well recognized in the fatal anaphylaxis which may follow penicillin, horse serum or procaine; but it may be forgotten that this potential danger accompanies the minute animal protein content of pertussis vaccine produced in rabbit serum and influenza vaccine in chick embryo, and also the bovine protein in ACTH. There remain classical allergies of the "delayed" type, in which pathogenesis depends on focal or generalized inflammation and collagen degeneration and not on release of histamine or serotonin as in the immediate reactions. This is exemplified in contact dermatitis seen commonly in nurses exposed to streptomycin, particularly by squirting air bubbles from the syringe and standing in the resultant shower. It is also exemplified by the syndrome of "serum sickness", which may follow eight to ten days after the administration of serum or penicillin. The first joint affected may be the temporo-mandibular joint, and the resulting trismus in a patient given penicillin or antitetanic serum after trauma may be confused with the onset of tetanus. More serious grades of this "serum sickness" or "drug sickness" may present as glomerulonephritis, myocarditis, peripheral neuritis or even polyarteritis nodosa. Certainly "Apresoline" in large doses may result in a condition indistinguishable from diffuse lupus erythematosus, except that it is reversible. The nodose form of polyarteritis appears to have become rare, but with an increasing incidence of arteritis affecting small vessels. There is accumulating convincing evidence that this condition of "sensitizing angiitis" may follow the administration of sulphonamides, penicillin, hydantoin and perhaps even the corticosteroids.

Conclusion.

It will be apparent that this classification has found no place for such well-known hazards as cholangiolitic hepatitis following chlorpromazine, the nephrotic syndrome following "Tridione" or the Hamman-Rich syndrome following "Dilantin" therapy, and for the moment these may best be considered in relation to the particular system which is dominantly affected. One may thus consider the hazards of therapy in relation to the liver. Some drugs—

for example, chloroform—appear to act as metabolic poisons, producing centrilobular necrosis with little inflammatory reaction. This is seen particularly in accidental exposure to carbon tetrachloride or phosphorus; the incidence is directly related to dosage, and the condition may be provoked in experimental animals. Some drugs—for example, chlorpromazine, methyl testosterone—cause centrilobular bile stasis with a clinical picture resembling extrahepatic biliary obstruction. The incidence is low, there is little relation to dosage and the condition cannot be reproduced in animals. Some drugs—for example, "Cinchophen", iproniazide—cause zonal necrosis with marked periportal inflammation, a clinical and pathological picture almost identical with viral hepatitis. Again, the incidence is low, there is no relation to dosage and the condition is not seen in experimental animals. Some drugs — for example, metahexamide, "Butazolidin" — defy even this superficial classification; there may be in the liver a mixed picture of bile stasis, zonal necrosis and periportal inflammation, and the liver damage may be only part of a more widespread toxic effect involving marrow, skin, myocardium, etc.

Finally, it must be realized that although the place of a drug may be established in the ætiology of a syndrome, the pathogenesis may remain obscure. For example, anæmia may be caused by drugs by many different mechanisms. Potassium chlorate appears to act directly on globin, "Primaquin" acts through an inherent enzymatic defect and quinine by haptene allergy, "Dilantin" results in a maturation defect, chloramphenicol produces marrow aplasia, and aspirin causes anæmia by gastro-intestinal bleeding. Instead of condemning the chemists and drug houses, perhaps we should thank them for providing the clinical tools for the study of these genetic errors and distorted physiology and immunology — or at least remember: "It is an ill wind turns none to good."

OPERATING THEATRE DEATHS AND THEIR PREVENTION.[1]

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I UNDERSTAND that a surgeon was suggested as a suitable speaker upon this subject; I am not sure whether the surgeons felt that the subject matter was too far outside, or perhaps too far inside, their province; but the upshot is that you do not have a surgeon.

Provided that they are fed and kept away from notoriously adverse factors in their environments, human organisms are expected to survive for three score years and ten, or thereabouts. They do this by virtue of reasonable anatomical construction and superb physiological arrangements for maintenance and protection. When they enter operating theatres, their anatomical integrities are disturbed by surgeons and their physiological integrities are disrupted by anæsthetists. Their respective resistances to dissolution are often already undermined by disease or by accident. These combinations of basic factors set up substantial environmental hazards, and many people emerge alive from these hazards because of their own capacities to do so, and because of the skill and judgement of their medical attendants. It would be unreasonable to expect that every patient would survive every time; we can be quite sure that no one of us will invariably display infallible judgement and faultless skill. In addition to contributions from the patient's side, our own human fallibilities will be the direct causes of numbers of operating theatre deaths. I can speak from reasonable experience of desperately ill patients in operating theatres; but I cannot honestly believe that death in the theatre was inevitable in a single one of these cases. Such deaths as did occur would not have occurred had one or other member of the theatre team displayed better judgement or more technical skill. Whatever this paper may go on to say, its author is not casting the first stone.. In addition to direct personal experience of operating theatres, my environment has been such as to bring to my notice many of the troubles occurring in other theatres. I believe myself, and I urge you to believe, that doctors cause the deaths in operating theatres. This paper will attempt to classify some headings under which they do it, and it will recommend an attitude of mind towards the problem. In a way it is unfortunate that any individual personal experience of operating theatre death will inevitably be small and infrequent. Constant awareness of its likelihood and fear of its occurrence would make us much more actively interested in its prevention. On an average two people die each week in New South Wales as a direct result of having anæsthetics for operations. The more one comes to know of the circumstances surrounding these deaths, the less possible it becomes to regard them as inevitable.

One or one hundred talks of this kind would not cover this problem in detail; I aim to speak broadly and to bring up principles in preference to specific recommendations. Principles have more universal applications, and remain in our minds after masses of detail have been forgotten.

Our Own Attitudes.

The first principle for consideration would be that the most certain of all preventatives of trouble will be our own attitude towards it; we should agree to accept personal responsibility for operating theatre deaths if they should be those of patients in our care. Moral responsibility only is meant — what we ourselves should feel inwardly, an attitude of mind. Our approaches will be quite different if we are prepared inwardly to accept full responsibility for what happens. Much more, and much worse, will happen throughout our careers if we can satisfy our consciences by attributing trouble to the drug, to the patient or to mischance. No refuge should be sought behind figures which purport to reveal an inherent risk attaching to a drug or to a procedure. The risk relates far more accurately to the administrator or to the operator. If we think back over our own individual careers, we can see how much more safety we can bring now to a variety of procedures which we carry out upon patients, compared with the same procedures when we first graduated. We cannot launch forth into practice with long personal experience to help us, but we can acquaint ourselves with the experience of others. By the time we come to employ a drug or a procedure, quite a lot will have been put on record concerning it; we ought to have looked over this record. Further to the printed word, there is likely to be a deal of useful knowledge in the heads of our immediate colleagues. This can be extracted from clinical meetings, and across the tea-cups, the bar and the putting green. There are no patents in our practice of medicine; doctors are willing to share their knowledge freely. Very particularly amongst ourselves we should subscribe to free reporting and free discussion of all forms of trouble not complicated by attempts to cover up. We are here this afternoon to think about real catastrophe — death in an operating theatre. There is not much to exceed the loss of the young mother of small children during the course of an elective operation, and it is not much more satisfactory really if the death occurs to her husband or to one of the children. I have mentioned that on an average two such deaths occur every week within New South Wales. It seems a worthy subject to consider at a meeting of the British Medical Association.

Acting within One's Capacity.

All surgery, and all anæsthesia, carries risk. So does travel upon the roads. We do not allow children to drive motor-cars at all, nor do we allow anyone to drive at super-speed. In none of these instances will we

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on October 29, 1960, at Canberra.

abolish the risk altogether but we should aim to keep it at a minimum. Comparison is possible between the child driving the motor-car and the untrained surgeon performing surgery and between high speed upon the roads and the untrained anæsthetist making use of relaxant drugs. It is not easy, over long spells of practice, to keep disaster away from patients while we are carrying out procedures for which we have been specifically trained over periods of years. There are methods of anæsthesia by which patients tend to remain alive unless active measures to the contrary are instituted by the administrator; with relaxants, active measures are needed to prevent patients from dying. A great deal more than haphazard acquaintances with rule-of-thumb procedures is going to be needed to keep out of trouble over a long series of cases with this so-called advance in medicine. Many a patient would be alive today if some wonder drug had not been given him needlessly by a doctor with an incomplete appreciation of its possible effects.

Some price will have to be paid for progress and teaching, in operating theatres as elsewhere. Teaching is less hazardous when expert supervision goes with it, and progress has long since arrived at the point where it is known that the more complex procedures are more safely carried out by those with special training. Not many amateurs can be found practising neurosurgery, ophthalmic surgery or radiotherapy. I have drawn your attention to one consequence of modern anæsthesia in operating theatres. It is many years since Ronald Jarman was able to relate the risks of much more simple forms of anæsthesia to the administrators, peaks of mortality occurring every three months, coinciding with the arrival of fresh batches of residents. In at least one of the main Sydney hospitals, no anæsthetic is given without the supervision of a consultant or an anæsthetist in training. Such a position obtains pretty generally throughout England. The danger of anæsthesia is apparently a true bill to a large number of people. At this stage and in this country we settle for compromise; but the compromise surely should exclude people from attempting feats beyond their capabilities. There is not much point in our spending public funds upon elaborate operating theatre equipment while no regard whatever is paid to the availability of people capable of employing it. The most vital factors in operating theatres wil be found to be the capacities of the teams working in them. We would do better if we concentrated more upon this aspect, even though we realize that there can never be complete fulfilment of the ideal. We cannot carry on practice by means of endless series of flawless experts, but surely we can leave the complex procedures to those specifically trained to cope with them. Circumstances may make us accept compromise, but the less of it we accept around an operating theatre, the more soundly we are likely to sleep in bed, and the less we are likely to have to answer for, temporally or spiritually.

Correct Initial Judgement.

We need correct initial judgement to put the patient at risk in the first place. The operation and the anæsthetic should be worth it — to the patient.

The general as against the local anæsthetic should be clinically justifiable, for the extraction of teeth, for example. Death as a consequence of dental nerve block or infiltration is virtually unknown; as a result of general anæsthesia for dentistry it is fairly common. If we think that the patient's own request to be unconscious lets us out under this heading, we have not thought much about it. How can a patient evaluate the respective risks when a good many doctors cannot?

Full Preparation.

Have we made full preparation for an operation we may reasonably expect to be necessary? If we are gynæcologists operating to cure uterine bleeding, have we ascertained the hæmoglobin value? Many such patients, who look well have eight or nine grammes of hæmoglobin per 100 ml. of blood, and their capacities to oxygenate their tissues are round about two-thirds of normal. These capacities will be less still when they have had further blood spilled out from them by operations, and their respiratory capacities reduced substantially by periods of anæsthesia in the Trendelenburg position. We need no advanced physiological knowledge, but rather plain ordinary common-sense and acceptance without dishonour of the fact that tissues bleed when cut, if we are to keep out of that kind of trouble. Surely any substantial operation implies a preliminary hæmoglobin estimation and blood-group determination. It also implies in many instances the physical presence of the right kind of blood. It is much easier not to be a blithe optimist in this connexion and so to be involved much less frequently in frantic resuscitation. One little ounce of preoperative planning is worth a ton of equipment for cardiac arrest. We shall come round to this later, but the over-all results of it are thoroughly disappointing, really. There is much less glamour in keeping death out of the operating theatre in the first place; but the practical results are very much better than endeavouring to defeat death after it has arrived.

Inhalation of Vomitus.

The most common way in which death does arrive is by the inhalation of vomitus, and we could well give some thought to this. Virtually it will not occur in the absence of full general anæsthesia, so that there is often a strong case for regional methods, and very often is it so when we are dealing with accidents and with obstetrics. You all know that the primary cause of maternal death is the inhalation of vomitus. Labour may last a long time, and food may remain in the stomach throughout. Put no faith in the historical belief in the four-hour interval; 15 hours may not be enough to empty the stomach once an accident or labour has supervened. Sometimes we shall have to operate and give anæsthetics in the presence of loaded stomachs. The likelihood of inhalation can be greatly reduced in the following ways:

1. By posture — the dorsal position for delivery has an evil record compared with the lateral. It has recently been stated that regurgitation from the stomach is physically impossible if a sufficient degree of head-up tilt is employed.

2. By decompression — so that regurgitation will not follow relaxation. It may not be possible to get solids up through the stomach tube, but most fatalities are due to liquids. The minimum useful tube diameter is 7 mm. Most people rate their lives higher than the discomfort of swallowing this.

3. By inhalational methods. These often preserve laryngeal reflexes at times when vomiting is likely.

4. By avoiding anoxia. Active vomiting is rare with a fully oxygenated patient.

5. By wearing braces and a belt. When every other preliminary has been attended to, still have the sucker switched on and beneath the pillow before commencing a suspect anæsthetic.

6. By the use of a cuffed endotracheal tube. If you are sufficiently experienced, use this in every emergency case at the earliest possible moment. If you do not know that the stomach is empty, it is safer to assume that it is not.

Mistaken Identity.

Mistaken identity takes in a wide range of trouble. The possibilities are truly legion, and they deserve our interest. If we operate upon the wrong patient or upon the wrong side, the consequences are usually medico-legal rather than mortal; but blood transfusion to the wrong patient caused death often enough until the prognosis was improved by better understanding of treatment in general and by the artificial kidney in particular. If your precautions should ever be defeated to the extent that incompatible blood is given, here is one parcel of

specific practical council: stop all drugs, seek immediate expert advice, and send the patient to an artificial kidney.

It has been stated that practically all deaths from local anæsthetics have resulted from gross errors in the identities of drugs and in the strengths of solutions employed. If we add to these errors in the placing of injections and incorrect appreciation of the toxicities of drugs such as lignocaine ("Xylocaine" as it is better known), we cover the range of possibilities from local anæsthetics. It should be within our capacities to close up every one of these stable doors and keep the horses of disaster within. Sister can hand us the ampoules; but if she is to fill syringes for us as well, we should be entirely satisfied on each occasion about the sources employed. This line of thought can go further than the local anæsthetics. Would your system allow you to be handed an infiltrating syringe filled with 1:1000 adrenalin solution? This substance occupies first place amongst death-dealing injections. If instead of solution we were being handed grenades, fused, and with the pins out, would we not feel that sooner or later we would run up against a sister who would not know to hold the lever down?

However much we may check the activities of our helpers, lives will be saved if the most important person in the theatre is still always prepared to receive help from the least important. Now and again the timid observation from the probationer will prove to be vital. A transfusion of incompatible blood has been arrested by a young nurse hesitantly telling a distinguished team that the group of the blood bottle differed from that upon the papers outside.

There has been a disastrous occasion when a junior's comment about the appearance of a local anæsthetic solution was brushed aside by a more senior party, and three patients perished from the ensuing injections.

Full Cooperation.

Full cooperation needs to be given and accepted by all within a theatre if trouble is to be kept at bay. Most of all this should be the picture between surgeon and anæsthetist; we are not yet so regimented that we cannot organize work to be done by teams of individuals who respect and trust each other, and we ought to have it that way. Surgery and anæsthesia are sufficiently absorbing to require complete freedom from emotional interference; clashes of personalities within a theatre are more than unbecoming to us. They are thoroughly dangerous to patients, since they will certainly cloud judgement and may well interfere with technical skill.

Personal pride has to be at a discount. The colour of the blood is the anæsthetist's affair; but every one in the theatre should be free to complain about it without arousing resentment. Tubes previously functioning well have kinked or become dislodged, oxygen cylinders have run dry, all kinds of things have been brought to notice by comment from elsewhere. Let us accord extra respect to the surgeon who ties the spare end of the tourniquet to the operating table, to the sister who keeps everybody waiting while she counts packs, to the anæsthetist who refuses to allow drapes to be flung across the patient's face at the end of the operation. More people can pick trouble in a face than in an exposed hand, and somebody may just notice something unusual while the anæsthetist is attending to something else. These people are all going round bolting stable doors against the horse that may get out just once during the year, the decade or the working lifetime.

None of us is free from the possibility of human error, but we can make the possibility more remote, both in ourselves and in our helpers. A nitrous oxide cylinder upon the oxygen yoke of an anæsthetic machine has usually killed the patient. The same could be said for ventilation of a patient after anæsthesia with thiopentone and a relaxant with a machine when it was not realized that the ether vaporizer had been left turned full on. Apparatus is extant in which an "emergency" nitrous oxide control can be left on and admit gas to the circuit with no indication of it on the flow-meters. Anæsthetists can release their patients from the foregoing and other possibilities by turning on the main cylinders on arrival, holding the mask upon their own faces, turning on the control which says oxygen and inflating their own chests with pressure upon the bag. Astonished anæsthetists are to be preferred to dead patients.

Switched on—Output Checked.

This is an application of a general principle that any piece of apparatus should be switched on and the output checked before connexion is made to the patient. The spectacular consequences of connecting "blow" instead of "suck" to a breast wound are usually seen outside rather than inside a theatre; but few things cause death more quickly than liquid ether down the treachea, when apparatus has been incorrectly joined up and then turned on.

Transfusions.

There are other causes of sudden death in the theatre. Air or oxygen pressure in a bottle of blood which runs dry unnoticed is a most reliable agent. This happened twice in a fortnight within my ken. If one uses adequately gauged needles or cannulæ, adequately long giving sets and stands which will extend to near the ceiling if necessary, there will be small need for pressure transfusions. If pressure is required, the correct thing is to milk the tubing with soapy fingers or compress a segment of it with some kind of rotatory pump. Another form of sudden death will thus be denied your patients.

While we are on the subject of transfusions, which play a large part in saving lives, let us agree to regard a transfusion as something which is putting the required amount of blood into a patient. Merely to satisfy the eye with a bottle of blood aloft, a giving set and a minute needle which will be lucky if it passes blood for an hour without blocking represents an ostrich-like approach to the patient's needs. If blood is required in a theatre, it is usually required in some quantity. Over-transfusion is a clinical rarity, and should be feared infinitely less than under-transfusion, which is common, and a disgrace to many nursing sisters and to many doctors. When transfusion was direct, by means of a pump between the parties, the equivalent of a bottle or more had to go in within nine minutes or so. We do not read of those practitioners being plagued with congested recipients. Death, actually within the theatre, is likely to occur when accident victims are submitted to operation in the absence of sufficient resuscitation. This is no news to many of you, and particularly to those who have been through war. There are occasions when the necessity to stop the hæmorrhage by surgery takes precedence over the demands of prior resuscitation, as offering the patient a better chance. These occasions are rare indeed within range of a transfusion service. Is the patient for whom this action is contemplated bleeding at a rate exceeding one pint per five minutes? Because transfusion can be given faster than that. If transfusion cannot be so given at need, then there is a gap in the defences through which preventable operating theatre death is due to come one day. A little story may illustrate this for us.

On one occasion, at about 5 a.m., a surgeon, an anæsthetist and some hospital residents assembled in a theatre. The patient was brought in literally breathing her last, unconscious, a peculiar grey colour, and taking about one breath per ten seconds. The surgeon and anæsthetist took one look at each other, and then some teamwork followed of a kind which I recommend strongly to you. The surgeon seized a scalpel, cut down in the front of the elbow and with his fingers held a cannula into a vein. Residents held successive bottles of blood aloft, while the anæsthetist wound furiously with a Julian Smith pump. At the end of about seven minutes three bottles of blood had been pumped into the patient, and the veins of her neck were substantially distended. She had become fully conscious during this procedure, and she said: "What is happening to me?" She was told that quite a deal had been happening to her really, and that it was proposed to operate on her after

perhaps a quarter of an hour, as she seemed to be a little congested just then. She said: "Yes, I think I could wait that long, you had better go and have a cup of tea; I'll be ready in about fifteen minutes." At the end of this time her congestion had entirely disappeared, and she was submitted to operation and stood it well.

Fire and Explosion.

A word on fire and explosion — rare but devastating, as a senior colleague once said of the complications of spinal analgesia. We now tend to be covered by things resembling the Lord Chamberlain's regulations about fire and explosion, and I merely urge that we respect the possibilities. The results of explosion often do not remain on view, but scarred faces after fire make lasting impressions.

Correct Perspective.

What could be more foolish, however, than restrictive ordinances, whether by hospitals or governments, by which, to escape the small hazard of fire amidst modern X-ray plants, we may be forced to employ fancy techniques beyond our capacities in the dark, where we cannot see trouble in the form of cyanosed patients?

Correct perspective may appear to be a strange aspect of the subject of operating theatre deaths, but in fact it is important. We must be able to deal with danger on a broad front, and not be led into trouble by pontifical precepts from specialized departments of knowledge. It is necessary for those in charge of operations and anæsthetics to appreciate priorities and choose the course of action which carries, not no risk at all, but the least of a number of risks. It will be poor indeed if people acting in this way can be embarrased subsequently by the production in unpleasant places, such as law courts, of unqualified prohibitory manifestos from experts in limited specialists' fields. Take blood transfusion as an example. We can and should go to all reasonable lengths to ensure compatibility of blood and recipient. It has recently been realized that there may be incompatibility with certain classes of recipients which will be picked up only by a complex cross-matching technique taking an hour and a half of time and substantial apparatus and pathological skill. When the transfusion can be foreseen and the required quantity of blood predicted, by all means let us have this and any other tests the experts may come up with. But, when a patient is in acute need of blood or more blood, let us not be told at some point along the chain of command that, in addition to the other delays which are likely in the circumstances, there will be a further delay of one and a half hours for this indirect Coombs test while the patient's cells are deprived of oxygen for that much longer. At need, surely the once-per-pancake-day chance of incompatibility will be held in the background of the picture where it properly lives, and not be allowed to displace from the foreground the common everyday cause of death — tissue anoxia. It is bad enough that we have to live so much by regulations without having people die because of regulations. From time to time the blind dead hand of authority can be found to be clearly against the interests of patients; people having operations or anæsthetics occasionally need to be given overwhelming rights against matrons, boards, hospitals commissions and governments.

The Serious Incident.

We may have carried out all proper preliminaries to an operation, and still there may arise a first-class reason for not proceeding with it if it is not immediately life-saving. If a serious incident occurs before such an operation is commenced, it is sound practice to accept the inconvenience, forgo the fee if necessary and defer the surgery. Some of these people can go on to die even without the operation from later-appearing damage to heart and/or capillaries. Acquaintance with a series of sad occasions on which this principle has not been followed prompts the foregoing suggestion; it should be allowed to extend beyond spectacular complications of the induction of anæsthesia. There may not be much argument about going home rather than proceeding to operate upon a patient who has recently been black, or pulseless, or having convulsions; but disaster has followed operations upon subjects unaccountably depressed by standard doses of premedication, and upon others when the first 50 minutes after induction of anæsthesia have been spent pulling and tugging to make the patient fit into unfamiliar accessories of an operating table. A major operation is a hazard in its own right. Such hazards should not be added to, and it is well worth bearing in mind that anoxic episodes, postural changes and unaccountable physiological depression are further hazards — there are enough pitfalls already without our accepting unnecessary summations of them.

Cardiac Arrest.

We promised ourselves something upon cardiac arrest. Let us have some practical principles about this spectacular, vastly disappointing, but most necessary final card to play against death. They may be set out briefly as follows:

1. Expectation. No anæsthetic, ever, should be given without the means of opening a chest and inflating the patient's lungs, preferably with oxygen. A cylinder, a face mask and a bag, and a pen-knife should be with you, not in the next room.

2. Recognition. There must be no argument, no stethoscope, no takings of blood pressure, no intubation yet. Is the aorta or the carotid pulsating? If it is not, then resolution.

3. Resolution. "This is it."

4. Trendelenburg position, to give the heart a maximum input of blood.

5. Inflation with oxygen. Already the patient's lungs should have been inflated with oxygen. This goes on throughout — intubate at convenience.

6. Compression. Push the precordium against the spine repeatedly, rapidly and with intent to break the ribs. This will give the heart an output which should be felt as a peripheral pulse, and may register as 80 mm. of mercury blood pressure. Commonly the heart will commence to beat forthwith. If it fails to do this promptly, then — incision.

7. Incision. Cut in the fifth intercostal space, well out in the axilla, a two-inch cut; does it bleed? If not, then keep going round the space to open it, stop an inch short of the edge of the sternum; you have enough trouble without a cut internal mammary artery to bleed and lose you the patient if your resuscitation succeeds.

8. Massage. Put your hand through and squeeze the heart rhythmically and repeatedly, pericardium and all, thumb in front, fingers behind, and do not poke the tips of them through the atrial wall. This may well start the heart. If not, keep going, and at this stage think about rib spreaders, colleagues, a quick cut through a costal cartilage to give more room, an incision of the pericardium missing the phrenic nerve, to give better access to the heart, and to see if it is fibrillating. Nine chances out of 10 it is not; but if it is, you need a defibrillator, which is employed only after the heart has been made pink and firm by massage. Once a circulation has been established by massage, you can take your time, provided you keep up the oxygenation of the lungs and the massage of the heart. They usually start and sometimes stop a few times more before keeping going, do not be in a hurry to close the chest.

9. Hypothermia — dehydration. The then-and-later swelling around the brain cells from the inevitable anoxic period is what you fear, it may be desirable to employ hypothermia and dehydration to mitigate this effect.

We are deep in discussion of a most serious and alarming subject. Let us come up for a breath of air while I tell you about a cardiac arrest with an ophthalmologist. This possibility is one which anæsthetists have used as banter amongst themselves, holding it out as the supremely irretrievable misfortune.

On this occasion the anæsthetist was taken in by a machine which continued to deliver ether after the ether control had been shut off, and the next thing there was a dead child before him. After twenty-something years, here it was at last. The anæsthetist seized the inflating gear which he had been carrying in and connecting up every time, just in case, right through his anæsthetic life; no good resulted from its application, and the eye specialist was then told: "Right, you are it!" The nice quiet operation for squint suddenly became the eye man's first thoracic operation. Without batting an eyelid he cut through the chest wall, reached in to the still heart and proceeded to compress it, while his colleague poured oxygen through the respiratory system. The heart started up, and by the time the chest had been closed a galaxy of pædiatric experts had gathered in response to distress signals. The surgery was checked over and approved, a dehydrating infusion was set up, the child was put into an oxygen tent and submitted to hypothermia. The tumult died away, and the anæsthetist went home to weep upon his wife's shoulder and lie awake with the image of the dead baby rising up before him. He had been in practice a long time, and it would not have been possible to comfort him by blaming the machine, or whoever else might have interfered with it. He had found out the true cause of anæsthetic death, long since, and he also knew how seldom cardiac massage was successful when initiated from outside the chest.

The child was still alive next day, and the day after, and the torment began to lift a little; could it be possible . . . ? By the fourth day it seemed clear that in fact this child had recovered without stigmata, and the sun shone again.

The following day, *en route* to another hospital, in dashed the anæsthetist to feast his eyes for a moment; up the stairs and round the corner. Something was said to him as he hurried past, but did not register, and the next moment he stood frozen in his track to the bedside. A group with long faces was clustered round the cot, and there beneath the oxygen drapes was the child—pallid, unconscious and with stertorous respiration—moribund, to any knowledgeable eye. As he stood there, swaying, a sister detached herself from the group, ran across and seized him. "You look worse than the patient!" she said, "This is another one. Yours is outside playing with its toys!"

Human Frailty.

The prevention of operating theatre deaths is a subject which is generally not well understood. Many have thought of it in terms of elaborate resuscitative equipment or perhaps in terms of misadventure, or moribund patients. It is well to think of it as being usually a reflection of human frailty. Frailty is a human characteristic, and we all possess a share. We have been at some pains this afternoon to imply that there are very many things that we ought to do and very many things that we ought not to do in order that death may be kept out of operating theatres. Alhough we resolve to do, or not do every one of these needful things, if a sufficient number of occasions are presented for human error to manifest itself, it will appear, a patient may die, and one of us will be responsible. Such occurrences need to be kept at the irreducible minimum. If our attitude will be to shift the blame away from ourselves when these times come, I am sure that they will come more frequently and we shall not be achieving the irreducible minimum. Very litle credit will ever be given us for the preventive measures which are so fundamental, and the means by which we apply them will be unspectacular and often unpopular. Even our colleagues when they become patients will despise our precautions; they will themselves arrive or allow members of their families to arrive in hospital at the last moment for operation; some of the doctors will be smoking and coughing furiously, and some of their children will have ice-cream sodas in their stomachs. Some of their wives will demand thiopentone in their beds. Well, there has been plenty of trouble, inside and outside operating theatres, from sputum in chests; there have been deaths from stomach contents in lungs; and one would think that the possibility of intense laryngospasm and bronchospasm in a bed with all facilities for resuscitation three floors away would be impressive to anyone. Patients are frequently grossly careless of their own safety; they can have most peculiar psychology, and they often resent your thwarting their foolishness. Let them be aggrieved! If they choose to make you responsible for periods when their lives are in fact at risk, they should accept all your criteria of safety, and such criteria should be manifold. They will be manifold if we resolve now that death will be our moral responsibility if it should occur, and if we so resolve it becomes probable that we shall encounter it very seldom—with luck perhaps never, and I certainly wish you all that luck.

THE MEDICAL ASPECTS OF ROAD SAFETY AND TRAFFIC ACCIDENTS.[1]

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THE medical and civil responsibilities of the doctor lie firstly in the prevention of road accidents and secondly in the treatment of the injuries resulting from those accidents which do occur. In this respect, as in other branches of medicine, one ounce of prevention is much better than one pound of cure. The necessity for the doctor to be concerned in this vital question of road safety can be found in a statement made recently by Dr. Paul Hawley, the Director-General of the American College of Surgeons and a member of its Committee on Trauma. He said: "The automobile is by far the greatest single instrument of disability and death in our society, not excluding even War." As a corollary, he went on to say: "No laws are so wilfully disregarded as those enacted by society to regulate traffic and to protect travellers."

Some Statistics.

In support of these assertions, I quote the following statistics: In the United States of America, where road accidents comprise 40% of all accidents, there have been 1,250,000 deaths from road accidents since 1900, whereas in all wars for the last 200 years, the number of deaths was 605,000. Coming nearer home, on the roads in Australia, since 1901, there have been 1,012,000 injuries (including 44,000 deaths), whereas in all wars (since the Boer War) the total number of casualties was 550,000.

However, despite what has been said concerning the difficulty of solving this problem, traffic authorities in the United States of America appear to be getting somewhere, as although the total number of deaths from road accidents in 1957 was 38,702, in 1958 there was a decrease to 37,000, despite a larger number of cars on the roads and despite a greater mileage travelled. In Australia the peak has not been reached, because in 1958 there were 2215 deaths and in 1959 the number had risen to 2419, although admittedly more cars were on the roads and more miles were travelled.

Causes of Fatal Accidents.

Excessive speed is by far the worst killer; after that come carelessness and inattention amongst drivers, many of whom may have neuropathic or psychopathic personalities.

In 50% of fatal accidents the driver of the vehicle has taken alcohol in some form or another prior to the accident. In 30% the main cause has been recklessness on the part of the driver; and in the remaining 20% the blame can be laid upon the driver going to sleep, taking a fit or suffering from diabetes, heart attacks, drug dependence or an emotional disturbance. Mechanical failures can be blamed for only a very small number of fatalities.

When it comes to the actual cause of death from traffic accidents, head injuries take the pride of place

[1] Read at the Road Safety Forum of the Second Annual Congress of the Road Safety Council of New South Wales on September 27, 1960.

and account for 70% of all deaths of persons riding in motor-cars or other types of motor vehicles, and for 80% of all deaths among motor cyclists. Next in order come injuries of the chest and abdomen, and lastly those of the limbs.

Moreover, traffic accidents are the greatest killers in the one to 35 years age group, not excluding any of the many serious forms of disease to which this group of persons are liable.

Prevention.

The doctor's role is essentially one of prevention—firstly the prevention of accidents, then, if accidents must happen, the prevention of injuries, and lastly, if injuries must occur, the prevention of death and permanent disability.

The Prevention of Accidents.

The chief measures advocated here are concerned with roads, speed limits, drivers and motor vehicles.

Roads.—The designing of roads, especially those with controlled access, and of their surfaces has already been dealt with by Professor W. R. Blunden of the Department of Traffic Engineering, University of New South Wales. The adequate lighting of roads, especially those in foggy areas, is very important and tests should be carried out with street lighting to make sure that an adequate number of foot-candles is available at all strategic points. The danger of long, straight and monotonous stretches of highway has recently been stressed, as these are likely to produce a hypnotic state and even sleep among some drivers. This leads to another very important point—that is, the occurrence of flicker produced by the sun shining through trees lining the road or casting shadows from telegraph and electric-light poles placed alongside a road. Flicker at varying rates is one of the methods used to activate the electroencephalogram of a person who is suspected of being an epileptic or of taking fits from some other cause; and if the flicker were to occur at some optimal rate, according to the distance between the trees or the posts in conjunction with the speed of the motor vehicle, then in certain persons a fit or a "black-out" could be produced. Thus the planting of avenues of trees at regular intervals alongside highways as a memorial drive should be avoided, unless they are planted so close together that they form a more or less continuous row. For the same reason, telegraph and electric-light poles should be placed far enough away from the edges of the roads to prevent their shadows falling upon the roads. The avoidance of glare from approaching head-lights is another important factor and it is suggested that yellow head-lights should be compulsory. This regulation already applies in France. The huge rear tail-lights which have recently appeared on many of the American cars and which are fitted to some of the latest Australian models are quite unnecessary. They are very confusing and should certainly be banned. Finally, every motor vehicle should be made to carry at least one reflectorized red triangle which can be erected and placed on the road at some distance behind the vehicle should it be necessary for the vehicle to be parked on the side of the road for repairs or any other reason.

Speed Limits.—Speed limits are very necessary but they must be enforced. In some places there should be a maximum speed limit and in others there should be a minimum speed limit. The latter limit should apply particularly on the main highways and on access-controlled roads. Certain sections could be observed by radar and offenders apprehended in that way.

Drivers.—Doctors can help the traffic department in many ways in the selection of persons deemed fit to hold a driver's licence. A very strict and complete examination of every applicant for a driver's licence should be carried out. This would involve some degree of expense, as such an examination could not be carried out in a few minutes and an adequate fee would have to be paid. It should certainly include a thorough investigation of the applicant's visual acuity, not only his ability to read test types but also his ability to judge distance and speed, especially that of vehicles approaching from the opposite direction or from one side. The ears and the hearing should be thoroughly checked and both divisions of the inner ear should be tested, especially the semi-circular canals, which control balance. Disturbances here can lead to attacks of giddiness and vertigo (known as Ménière's syndrome). They can come on suddenly and make a person quite incapable of controlling a motor vehicle. In cases of young persons with a past history of rheumatic fever and of elderly persons a thorough examination of the heart should be carried out, and if there is any suspicion of trouble an electrocardiogram should be taken. Finally, in the case of any person who has ever had any sort of a faint or "black-out" or who has a family history of epilepsy, an electroencephalogram should be taken. This may unearth many persons with abnormal brain-wave rhythms as well as the true epileptics. In the same category come the persons who have to take drugs or other substances, such as insulin, regularly. This brings up the burning question: "Should a Doctor Tell?" At present, and according to the Hippocratic oath which is taken at graduation, a doctor is not allowed to divulge any information he may obtain from, or about, a patient in the privacy of his consulting room or elsewhere, without the express permission of the patient concerned or without specific instructions from a judge in a court of law; but every doctor has, among his or her patients, persons who are known epileptics or severe diabetics, or persons with unstable electroencephalograms resulting from head injuries or from the removal of brain tumours, who are liable to take fits and yet who have licences to drive motor vehicles. This question will be taken up again when certain recommendations are presented at the conclusion of this paper. Certain persons with neuropathic and psychopathic personalities should also be excluded from holding driving licences; and as these conditions are not always obvious at a first examination, it would be advisable to have examinations for driving licences repeated at intervals of three or five years, at which times the applicant's record as a driver of a motor vehicle during the preceeding period would be available. The education of prospective motor-vehicle drivers whilst they are still at school should be worthwhile; and although, as stated by Mr. K. J. Andrews, the headmaster of the Sydney Boys' High School, there certainly does not appear to be much time for this to be carried out during the school term, a sort of summer camp, held during the Christmas and summer vacation, could be set up very profitably, where a training programme could be carried out and diplomas issued to those who qualify at the conclusion of it. This procedure is now being adopted in many of the States of North America and certain advantages, in the way of reduced insurance premiums and other financial benefits, accrue to the driver who earns one of these diplomas.

Motor Vehicles.—Motor vehicles could certainly be made safer for the average driver by more easily controlled steering mechanisms, by better road-holding qualities, by a lower centre of gravity, and by other technical features already known to motor engineers. Although installing the engine in the rear is economic and effective (as demonstrated particularly in some Continental cars), at certain times the road-holding qualities of the vehicle may be affected; and certainly, if there is to be a head-on collision, the lack of protection from the engine may well be the deciding factor in producing one or more fatalities.

The Prevention of Injuries.

If it is presumed that a crash between two motor vehicles, or between a motor vehicle and some other object, movable or immovable, is inevitable, then there are certain features which should be incorporated in the construction of motor vehicles and certain articles which should be supplied as standard fittings, in order to prevent specific injuries to the passengers or at least to lessen their severity. In this respect, it might be said that "never has the destiny of so many thousands been in the hands of so few"—that is, the hands of the designers of

the modern motor vehicles. A closer study of the mechanics of the motor vehicle in relation to the mechanics of the human body is necessary; this opens up a new field of science, aptly named biomechanics.

The first essential is to make compulsory the equipping of all motor-cars with a safety harness. Such a harness should include shoulder supports and braces as well as the ordinary safety belt. The shoulder harness is necessary to avoid the dangers of the "whiplash" injury which occurs to the neck when the body is suddenly jolted forwards and then returned to its upright position, at which time the neck is "cracked" just like the end of a whip and a fatal fracture-dislocation can occur. In order to make this safety harness effective, the front seats and the harness must be bolted down on to the chassis; and the harness must be fastened around passengers in the rear seats as well as those in the front seats. The safety harness is the greatest factor in the saving of life and of serious disability in traffic accidents. If the victim is thrown out or ejected from the motor vehicle, there are five times as many chances of death as if his body remains inside the vehicle. In other words, ejection from the vehicle accounts for 60% of all serious injuries and 80% of all deaths in traffic accidents. There should be no prejudice against the use of the safety harness, as it can be made to fit comfortably and a person soon gets used to it. Wearing it on long trips may even save a lot of the sense of fatigue.

It is of interest to note that, in Sweden, where the fitting of safety harnesses to motor-cars is compulsory, according to the figures for the last available year, 300,000 sets of safety harness were sold, whereas only 160,000 new motor cars were placed on the roads. In England, it is rapidly gaining popularity, perhaps because of the example set by His Royal Highness the Duke of Edinburgh.

The next essential is some form of protection for the head itself. In the case of motor-cyclists, the crash helmet, originally designed by the late Sir Hugh Cairns, has now been adopted almost universally and has saved countless lives. However, when it comes to motor-cars, most people remove any headgear they have when entering the car; and although a crash helmet may not be essential, some form of close-fitting head-gear, such as a beret with a thin skull-cap of metal as worn by jockeys, or of some other hard material, should be worn, especially on long trips, during which there is more danger of accidents occurring. A comfortable, protective head-gear has been designed by the British Hat and Allied Felt Makers' Research Association. Bench testing indicates that these caps and hats absorb 60% of a 4000 lb. blow.

With regard to the motor vehicle itself, the following alterations in design and manfacture should be adopted: (i) a collapsible steering column, or perhaps no steering column at all, as advocated by Professor William Gissane of the Birmingham Institute of Accident Surgery (other transport vehicles, such as aeroplanes and the old-fashioned electric brougham, are steered with foot controls or with handles, so there does not seem to be any reason why the same methods could not be adapted to motor vehicles); (ii) a well-padded dashboard without any projecting features, and padding on the back of the front seat, which would prevent injuries to persons being thrown against it from the back seat; (iii) adequate locks for the doors, so that they will not open in the event of a crash and allow the passengers to be thrown out; (iv) a high back to the front seat, if possible high enough to support the head and thus prevent the "whiplash" injury to the head and neck; (v) buffers for the front bumper bars, so that part of the shock of hitting any object, or of hitting a pedestrian, could be absorbed; (vi) narrow front pillars, to allow for a full field of vision to the driver; (vii) the complete absence of any form of projecting knob or fitting, either inside or outside the vehicle.

The Prevention of Death and Permanent Disability.

The prevention of death and permanent disability is really the technical role of the doctor; when the accident has become inevitable and injuries have been sustained, the accent is on the salvage of the victims.

Salvage of the victims begins with first aid, which must be quickly and scientifically applied as soon as possible after the accident; and this is where the new specialty, known as traumatology, comes in, with the teaching and training, not only of first-aid men, ambulance attendants and nurses, but also of young graduate doctors, who are usually the first to examine and treat the patients injured in traffic accidents.

As a corollary to this, modern and efficient methods of transportation must be provided; this involves the provision, not only of motor ambulances, but also of the equipment which should go into them for dealing with every type of emergency. The transportation of the injured person and of the emergency patient has been receiving particular attention in the United States of America and especially in Flint, Michigan, where Dr. George J. Curry has built up a very efficient transportation system with a very well-trained staff in connexion with the emergency service of the Hurley Hospital. Under this system, the ambulances are supplied with special litters as part of the "Transaver" transportation equipment. The patient can be placed on the litter at the scene of the accident, and transported on it in the ambulance to the emergency station at the hospital. There the litter is placed on the special trolley, and the patient is examined, radiologically if necessary, while still on the litter and trolley, and then taken to the operating theatre and placed on the operating table itself. The patient is not removed from the litter until he is finally put into a bed in the post-operative recovery ward or the intensive treatment ward, so that four or five moves are saved, any one of which could prove fatal. A "theatre canvas", to which poles can be fitted, has been used by Station Officer Scott, of the Latrobe Valley District Ambulance Service at Traralgon, Victoria, for the past five years and has proved to be most effective in saving unnecessary moves.

While one is on the subject of transportation by motor ambulances, it should be pointed out that the speeding of ambulances is quite unnecessary, and that in many instances, in an attempt to save a few minutes' time, further harm can be done to the patient and another accident can, and often does, happen. Provided that the ambulance has the necessary equipment to deal with severe hæmorrhage, asphyxia, and apnœa (cessation of breathing) by means of tourniquets, oxygen and artificial respiration, then no life is going to be saved by shortening the journey by minutes.

The next important point is the provision of adequate accommodation and facilities at hospitals for the reception and immediate treatment, at any time of the day or night, of accident cases. This would require a lot of finance, but the amount involved would fall far short of the financial losses which are being incurred through the unnecessary loss of active working lives and the unnecessary long periods of disablement which could well be shortened in many instances.

Now that tuberculosis is under control, as a result of the efforts of the Federal Government during the last decade, the time is ripe for this Government to devote its attention and energies to salvaging road-accident victims by sponsoring a National Accident Treatment Service (N.A.T.S.), which would provide adequate care and treatment, at the right time and place, for all types of accident victims and to continue to look after them until they are fit to resume their pre-accident occupation or some other form of gainful employment.

As an example of how lives can be saved by the provision of an efficient service for the treatment of head injuries, one reads that at the Accident Centre of the Radcliffe Infirmary at Oxford, where the death rate for the first 1000 head injuries admitted was 9%, in the most recent and fourth series of 1000 cases, this has been reduced to 3·2%. Of course, results like this are not easy to obtain and can be brought about only by doctors who are well trained in traumatology in all its various aspects, and by team work.

Recommendations.

The following recommendations are submitted for the consideration of your Road Safety Council.

1. A better selection should be made of persons fit to hold driving licences, through a Medical Traffic Safety Committee, which would act as a *liaison* between the medical profession and the governmental bodies controlling traffic. Such a committee would receive and consider reports on patients referred to it by general practitioners and specialists because they are considered to be unfit to hold driving licences on account of epilepsy or any kind of fits, diabetes which is severe enough to require the administration of insulin, mental disease, emotional disturbances or accident-proneness. Such a committee would have to be granted legal "privilege" to divulge the names of such persons to the traffic authorities.

2. Particulars of medical examinations, blood groups, allergies to drugs and any special diseases should be recorded on the licence forms of all drivers. These particulars would be a great help to the examining doctors in the emergency rooms on admission to hospital, especially if the person is unconscious and unaccompanied.

3. There should be adequate training of rescue squads, ambulance drivers, orderlies and other first-aid personnel in the early treatment and transportation of all forms of accident cases, especially in the use of the "Transaver" equipment or the use of a "theatre canvas" in place of a litter.

4. Basic research should be carried out into the causes and the effects of all types of traffic accidents, and into the best ways of avoiding them in this country. The importance of this form of research has already been realized in other countries. In the United States of America, the Cornell Crash Injuries Research Unit, set up at the New York University and working in conjunction with the Committee on Trauma of the American College of Surgeons, has already supplied much valuable information; and quite recently in England, a Road Injuries Research Group has been set up, with funds given by the Automobile Association and sponsored by the Duke of Edinburgh, to work at the Institute of Accident Surgery at the Birmingham Accident Hospital, under the guidance of the clinical director, Professor William Gissane. A similar group or unit should be set up in this country by the Federal Government, upon receipt of the report of the Select Committee of the Senate on road safety.

Reports of Cases.

SNAKE BITE IN A SUBJECT ACTIVELY IMMUNIZED AGAINST SNAKE VENOM.

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SINCE ancient times man has believed that repeated exposure to the venom of snakes induces a resistance to the toxic effects of venom. The natives of Mexico introduced rattlesnake venom into various parts of the body by the use of a snake fang (Calmette, 1908). This and other practices which were employed by primitive tribes to acquire protection against snake venom have been reviewed by Klauber (1956).

In recent years attention has been directed to the effects of repeated snake bite in the same individual. The evidence that any permanent immunity is acquired as a result of repeated snake bite is equivocal (Watt *et alii*, 1956; Parrish and Pollard, 1959; Wiener, 1960). However, when cobra venom was injected into a subject over a period of several years, a degree of active immunity could be induced which enabled the subject eventually to tolerate 40 mg. of venom (Haast and Winer, 1955).

Similarly, after active immunization with tiger-snake venom, another subject was eventually able to tolerate 25 mg. of venom (Wiener, 1960). The subsequent experience of this subject after a tiger-snake bite is here reported.

Clinical Record.

The subject, a man, aged 47 years, was in good health and weighed 70 kg. For many years his hobby has been the study of snakes and the collection of venom from them. In the pursuit of these activities he has been bitten several times by various species of Australian snakes. Because serum reactions developed on two consecutive occasions after the injection of antivenene, active immunization with tiger-snake venom was commenced in 1958 and continued over a period of 13 months.

During this time 20 injections of venom were given. The initial dose of venom was 0·002 mg. of venom, and the final dose was 25 mg. The maximum level of circulating antivenene reached during the course of immunization was 5·2 units per millilitre. Four months after the administration of the final dose of venom the antivenene titre was 2 units per millilitre of serum. Further details concerning the response of the subject to active immunization until 1959 have been published previously (Wiener, 1960). Since then the antivenene titre has ranged from 0·5 to 2·5 units per millilitre, depending on the interval of time which was allowed to elapse between booster injections of venom.

On September 23, 1960, the subject was bitten whilst handling a tiger-snake measuring about three feet in length. The bite was sustained in the interdigital space between the right index and middle fingers. A stinging sensation was experienced at the time of the bite, and some drops of blood were visible at the site of the two puncture marks. No tourniquet was applied, nor was any other treatment given. The patient had been actively immunized against tetanus on a previous occasion.

Within a few minutes after the bite, local œdema occurred at the site of the bite, and during the next 24 hours the swelling involved the dorsum of the hand and extended up the arm to about three inches below the elbow joint. The back of the hand was itchy. There was no lymphangitis, and no generalized toxic effects occurred. The swelling started to subside 30 hours after the bite.

When the patient first reported the accident 70 hours after the bite, slight pitting œdema on the dorsum of his right hand was still present. Two healed puncture marks were visible at the site of the bite. There was no enlargement of the regional lymph nodes. The pulse rate was 70 per minute. The blood film and urine showed no abnormalities. There were 375 eosinophils per cubic millimetre of blood.

The antivenene titre of the serum of the subject was 0·5 unit per millilitre 11 days before the bite, whilst three days and 18 days after the bite the antivenene titres were respectively 1·0 and 3·5 units per millilitre. Four weeks after the bite, the titre was still 3·5 units per millilitre. Precipitating antibodies were also present in the serum of the patient before and after the bite.

Discussion.

For two reasons it can be inferred that the snake which bit the subject injected venom during the bite, although the actual amount injected cannot be determined. The immediate and pronounced swelling which occurred soon after the bite is interpreted as having been due to the reaction of venom with antivenene in the tissue spaces. The presence of precipitating antibodies in the serum of the patient supports such a view. The occurrence of antivenene in tissue spaces has been demonstrated in the case of animals immunized against cobra venom (Kellaway and Williams, 1932). Secondly, the rise in the antivenene titre, which was demonstrable on the third day and again on the eighteenth day after the bite, indicates that venom or a venom-antivenene complex has become absorbed, thereby providing the antigenic stimulus for the observed rise in the antivenene titre.

The localized antigen-antibody reaction which occurred was not followed by eosinophilia. Similarly, when purified venom was injected into the subject during the course of active immunization, varying degrees of localized œdema frequently occurred at the site of injection without the accompaniment of eosinophilia. The rapid spread of the œdema which occurred after the bite may have been due to the presence of hyaluronidase in native venom.

As the circulating plasma volume constitutes 5% of the body weight, our subject had approximately 1700 units of antivenene circulating in his blood at the time of the bite. This amount of antivenene is sufficient to neutralize 17 mg. of venom. However, the actual degree of protection in an actively immunized person is considerably higher than appears from an estimate based on the total amount of circulating antivenene alone. About 50% of the total gamma globulin in a normal person is found extravascularly (Gitlin, 1957).

In clinical practice, the aim in the treatment of a bite by a venomous snake is to introduce, with as little delay as possible after the bite, sufficient specific antivenene into the circulation of the patient to neutralize all the venom which the snake has injected. The recommended procedure in the case of bite by a tiger-snake is to inject an initial dose of 3000 units by the intravenous route. This amount of antivenene will neutralize *in vitro* 30 mg. of venom, which is approximately the average venom yield of an adult tiger-snake (Freeman, 1934). However, if there has been any delay in treatment, and if the early onset of severe symptoms suggests that more than the average amount of venom has been injected by the snake, then a considerably higher dose of antivenene has to be given, as determined by the response of the patient.

In an actively immunized person, venom introduced as a result of a bite is neutralized to some extent before it enters the blood-stream or lymphatics, while after absorption it is neutralized by antivenene which is already present in the circulation. The sustained presence of only one unit of antivenene per millilitre of serum in an actively immunized subject provides a degree of protection which an injection of 3000 units of heterologous antivenene after the bite cannot match. In our case, protection against the bite of a young snake was evident with an antivenene titre of 0·5 unit per millilitre of serum.

The indications for active immunization against snake venom are those which led to the immunization of our subject — namely, sensitivity to horse serum in an individual who is constantly handling venomous snakes. Individuals who handle snakes, even if they are not sensitive to horse serum, and those who are going to isolated areas where snakes occur and no medical attention is available, may also be suitable subjects for active immunization.

Repeated booster injections are necessary to maintain a protective level of circulating antivenene. Since symptoms of envenomation may appear within an hour after a bite, and in view of the fact that the body will be exposed to the maximum amount of venom at the time of the bite, no reliance can be placed on the "booster" effect of venom introduced by the snake. However, such a "booster" effect may follow a natural bite, as occurred in our subject.

Although our subject did not show any signs of infection after the bite, this complication may follow snake bite, since bacteria are frequently present in both the saliva and the venom of snakes (Williams *et alii*, 1934).

Summary.

A case of spontaneous recovery from the bite of a tiger-snake in a subject actively immunized against tiger-snake venom is presented.

No generalized toxic effects occurred.

Since the titre of circulating antivenene before the bite was 0·5 unit per millilitre, it is estimated that at the time of the bite the patient could tolerate at least 17 mg. of venom.

From the local effects and the rise in the antivenene titre which followed the bite, it is inferred that venom was injected by the snake at the time of the bite.

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RED-BACK SPIDER BITE (LATRODECTISM) WITH RESPONSE TO ANTIVENENE THERAPY GIVEN EIGHTY HOURS AFTER THE INJURY.

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A MARRIED officer, aged 46 years, with 22 years of military service, was bitten at about 6 a.m. on March 1, 1959, at Port Augusta, South Australia. The agent responsible for the bite was not seen at any stage, but from circumstantial evidence and from other features, the bite may be identified with confidence as that from the Australian red-back spider, *Latrodectus hasseltii* (Thorell, 1870).

The patient was at stool in a country toilet when he noticed something touching his scrotum slightly, and thought it was a fly. This happened two or three times, and he jumped up and down several times to shake it off. On rising he noticed a thread attached to his penis, like a thick strand of spider-web, with three or four yellowish balls[1] strung along it — globules about the size of a grain of wheat or smaller. He then felt a bite on the underside of the penis, straddling the frenulum of the prepuce (he is circumsized). On examination he could not identify any actual bite, but at a later stage he noticed some small purple discolorations about one-quarter or half an inch apart, in sites at which he believed punctures had occurred, but these discolorations were not certainly identified by the present writer when the patient came under his care.

The same evening the patient commenced to sweat profusely, so much indeed, that his legs were bathed in perspiration. Minor discomfort had been present in the genitalia, but rather more severe pain now commenced in the groins and the suprapubic region. No pain was experienced in the penis except for the initial punctures. Some aching and tenderness was felt in the testicles, but this was not very severe. The curious feature about the sweating recorded that evening was its marked localization. Although the sweat was pouring off the patient's legs (he became quite thirsty), the upper limit of the sweating was sharply demarcated by the level of the lower border of the patella. The amount of sweating from the legs decreased over the next few days, during which time he sweated over the buttocks

[1] Dr. S. Wiener, in a personal communication, has commented that these "are the characteristic egg sacs of *Latrodectus hasseltii* (in this case perhaps smaller than when they are made in more hygienic or less disturbed surroundings)".

and thighs, as well as on the right forearm, around the left wrist and on the anterior surface of the left upper arm.

The most severe symptom was the pain in the legs, particularly the feet, where it appeared largely to be localized to the balls of the feet. The patient described the pain as "hell" — "as though the feet had been frozen and [he] had been forced to walk in them" — "as though he had walked a hundred miles in new boots". No superlative was sufficient to describe the pain. (He appears, on his recovery, to be quite a normal person without any tendency to exaggeration or dramatization.) As did the sweating, the pain commenced in the evening of the day he was bitten — that is, about 13 hours after the bite. The pain remained continuously until after the receipt of antivenene.

In addition to the pain in the feet and the front half of the legs the patient felt a lesser sensation, of "aching all over, as though I was getting the influenza". It was, in fact, largely on account of this sensation, and his failure to see any spider, that he tended to ascribe his symptoms to the "flu", and not to seek medical advice. He had also been bitten once previously by a red back spider, and considered himself immune — this fact emerged later.

Paræsthesia was also present. Initially (that is, on the first evening) when his foot touched the sheet in bed he felt as though his foot had been cut with a knife. He was so sure of this that he made the orderly look at his foot for the blood, and was surprised when none was seen. Subsequently this sensation lessened, but after being touched by the fingers of the examining doctor, he continued to feel the fingers upon his leg for some time afterwards, and he had to look to be sure that the doctor had taken his hand away.

Other sensations were experienced. He was troubled with his vision, and could not read, as the lines of print (even the large ones in the newspaper) seemed to be doubled and he could not fuse them. The newspaper columns also seemed to run obliquely. The single light over the bed appeared multiple. He complained also of agitation and a feeling of depression.

He was admitted to the camp hospital at 10 p.m. on March 1, and was described in the case notes as a "grizzly agitated man — considerable gross tremor of hands at times with generalized shaking". On examination at that time his temperature was found to be 98·2° Fahrenheit, his pulse rate was 85 per minute and his blood pressure was 140/90 mm. of mercury. The case notes continue:

> Penis has no obvious local lesion. No inguinal lymph node enlargement. Lungs clinically clear. Legs — feet feel cold and are sweating — more sweating on feet than elsewhere on body. Peripheral nerves normal. Knee jerks equal and hyperactive. Ankle jerks equal and hyperactive.

At 11 p.m. 1·5 grains of phenobarbital were given by intramuscular injection.

On March 2, 1959, the patient was still very restless. At 1 a.m. he was given 3 grains of "Nembutal", then at 1.30 a.m. two tablets of *Tabellæ Codeini Compositæ*. At 2.30 a.m. he was still very restless and complained of pain in the feet, although it was remarked that he did not appear to be in great pain. He was given half a grain of "Omnopon" and he settled down. At 9 a.m. he was less agitated, but was still complaining of pain in the feet.

> Now has generalized urticarial rash, otherwise findings the same.

He was treated with 100 mg. of "Antistine", given by intramuscular injection and the rash subsided.

He was then transferred to the Repatriation General Hospital, Springbank, South Australia, and arrived at 4 p.m., on March 2, having travelled from Port Augusta. His temperature had not been elevated, being recorded as 98° each time it had been taken. His clinical notes recorded also that his respiration and pulse rates had been unaffected, that he had been intensely agitated, as in an acute anxiety state, and that his tremor had persisted.

The writer first met the patient on his arrival at the hospital. As the writer entered the ambulance, the patient said: "Ah — a white coat — that means business." He made similar remarks to hospital staff after his arrival in the ward. After his recovery he remembered making these remarks; it was apparent that this "wise-cracking" is not usual for him, as he himself stated. His clinical condition was the same as that previously recorded. The irritation of the legs and lower part of the abdomen continued. The only feature not already mentioned was that he had some conjunctivitis. His symptoms were partially relieved by the administration of 0·25 grain of morphine by hypodermic injection.

The patient was obviously in no danger, and it was hoped that his condition would soon improve. However, there was very little diminution in his symptoms, and it was decided to give him some antivenene, although it was by now more than three days from the time of the original bite. (The Commonwealth Serum Laboratory pamphlet on the subject claims: "Antivenene has been administered 48 hours after a bite with dramatic improvement of the patient.") It took some hours to locate a supply of the antivenene in Adelaide on this occasion. One millilitre (500 units) of Commonwealth Serum Laboratories antivenene was administered intramuscularly into the buttock at 1.48 p.m. on March 4, 1959 — that is, 80 hours after the bite.

It was not until six hours later (8 p.m.) that the patient noticed any difference. Then during the hour from 8 p.m. till 9 p.m. his symptoms completely left him — the pain in the feet and legs, the misery and the sweating. He was no longer conscious of his heart beating, and his shivering and desire to weep on being spoken to disappeared. He had had some pedal intertrigo and the first sign of the relief of his symptoms was the disappearance of the itch between the toes.

He was naturally delighted at this response. He rapidly became cheerful and sensible. He agrees that his response to therapy was dramatic. When reexamined after his recovery, on the afternoon of March 5, he was clinically normal. The knee jerks were now rather sluggish, after having formerly been rendered hyperactive by the venom. The blood pressure was 120/70 mm. of mercury when the patient was lying down, and 105/70 mm. of mercury when the patient was sitting up.

The further convalescence of the patient was uneventful. On March 6 a very slight papular rash was seen to be present around his ankles. This rash lasted only a short time, and was not considered to be of any significance.

The patient had been apyrexial during his entire stay in hospital, the maximum temperatures recorded being 99° and 99·8° Fahrenheit. The pulse rate had been unaffected, the maximum recorded being 92 per minute and the minimum 68 per minute, and the readings had been mostly between 70 and 80 per minute.

During the period from March 3 to March 9 the urine had ranged in specific gravity from 1010 to 1020. The reaction was acid, and the only unusual finding was a "slight trace" of albumin noted on one occasion. Microscopic examinations of the urine on March 6 and March 9 yielded no abnormal findings. The electrocardiogram was normal on three occasions (March 5, 6 and 9). An X-ray film of the chest taken on March 6 was normal. A hæmatological examination on March 6 revealed a hæmoglobin value of 16·0 grammes per 100 ml., with a red-cell count of 5,600,000 per cubic millimetre, a hæmatocrit reading of 47%, a mean corpuscular volume of 84 c.μ and a mean corpuscular hæmoglobin concentration of 36 grammes per 100 ml. The white-cell count was 5500 per c.mm., of which 63% were neutrophils, 24% lymphocytes, 5% monocytes, 8% eosinophils, and 0% were basophils. The blood sedimentation rate was 20 mm. in one hour (Wintrobe).

The patient was permitted to read the Commonwealth Serum Laboratories pamphlet accompanying red back antivenene, which includes an acount of the symptoms of arachnidism. He was delighted that the account there described his symptoms perfectly, as he had "felt a fraud" with his complaints, and considered the account "made an honest man of him". He was also determined to wage war on the red back spider, and proposed to commence this campaign by including the two paragraphs under the heading "The Spider", from the Commonwealth Serum Laboratories pamphlet, in his Camp Standing Orders.

The patient gave a history of having been bitten on the finger by a red-back spider as a child in South Australia. He could not now remember the event himself. One reason he did not at first accept that he had been bitten by a red-back spider was that he believed the childhood bite would have conferred immunity upon him.

Comment on Some Clinical Features.

The clinical history given is typical of the effects of the bite of *Latrodectus hasseltii*. The circumstances surrounding the bite are also typical for this spider. It is proposed to comment briefly on a few of the clinical features of red-back spider bite.

The most prominent and typical features of red-back spider bite are the pain and sweating, although various others occur—for example, dyspnœa, vomiting, pyrexia, agitation, depression and cardiac irregularity. Symptoms may last some considerable time, a duration of several days being quite common, and much longer periods have been recorded. The first accounts indicating that the symptoms from the bite of this Australian spider may last much longer than 24 hours were by Ross (1891) and Cockburn (1891), who recorded severe symptoms as lasting two or three days.

Rogers (1891) appears to have been the first to give detailed and precise case histories recording the prolonged pain, sweating and other symptoms, although he commented that his cases were not studied as carefully as he had desired. In Case I the patient suffered pains which persisted for two months. Sweating was not mentioned, the skin being recorded as "dry and hot". In Case II the symptoms lasted over a week, and here also sweating was not mentioned. In Case III, which was "very similar" to Case I, symptoms lasted over two months. In Case IV the patient, a man bitten on February 8, 1890, had marked local sweating. This appears to be the first mention in the Australian literature of this characteristic feature. The Australian literature is summarized by Cleland (1912, 1916, and later papers in the same series). Parry (1894) also mentioned the "cold perspiration", the symptoms recorded as having lasted two weeks. Pulleine (in Cleland, 1916; also repeated in Murray, 1946, who gives a useful review) observed marked sweating lasting five days after an experimental bite. Sutherland (1921, 1922), writing from Narromine, New South Wales, referred to bites from red-back spiders as being numerous and commented (1921): "Such a bite usually means a week of continuous aching and pain accompanied by drenching sweats." A similar statement was made in his second (1922) communication.

Hales (1928) recorded the case history of a girl, aged five years, bitten on the hand by a red-back spider, in whose case the sweating lasted nine days. This patient suffered a transient bulbar palsy, and also developed an irritable rash over the body on the fifth day, which subsided in four days. W. K. MacGillivray (Cleland, 1942) stated: "The neuralgic pain and cold sweating of the extremities last from one week to six and may be very distressing."

According to Wiener and Fraser (1956), localized sweating at the site of the bite appears to be a characteristic action of the venom of *Latrodectus hasseltii*. They recorded that in volunteers the intradermal injection of minute amounts of venom resulted in localized sweating lasting four to five days, and suggested that "the presence or absence of localized sweating at the site of the bite may be of diagnostic value".

Skin Rashes and Other Reactions.

In the case recorded above a transient skin rash occurred on the sixth day. Tidswell (1906), reviewing the previous literature, stated: "Various skin lesions, such as erythematous rashes, papules, vesicles, pustules, etc., may occur during the protracted convalescence", and this statement is paraphrased by Kellaway (1930). Lethbridge (1930) recorded one case of a patient with a miliary rash on his body. Hales (1930), in a discussion of the preceding paper, referred to a case of red-back spider bite in a child (the case recorded by him in 1928), in which "localized swellings of the face [right cheek and upper lip] had appeared. Swellings had appeared and disappeared in various regions"; even the glottis had been affected.

MacPherson (1935), in an excellent clinical account, wrote: "Profuse perspiration may occur and erythematous or miliarial rashes on the trunk or limbs", and recorded also various immediate local effects:

> The wound itself may show only a small red mark with no local swelling. Or there may be a typical urticarial weal, with surrounding swelling and exudation, or an areola of red with a white or vesicular centre. There may be ecchymoses round the punctures. Local reaction may be very intense . . . Œdematous swelling of various parts, including the face and legs, has been described.

The Response to Therapy by Antivenene.

Antivenene has only recently been introduced for the bite from *Latrodectus hasseltii*, following the work of Wiener (1956*a*, *b*). Wiener and Fraser (1956) recorded the case history of a woman, aged 36 years, who was treated with 1 ml.[2] of antivenene. Her pain completely disappeared within half an hour. That case is presumably the one upon which is based the statement in the Commonwealth Serum Laboratories pamphlet accompanying or describing their antivenene, that treatment with antivenene had been successful when given up to 48 hours after the bite.

In the present case antivenene was not given until 80 hours after the bite. The response to therapy in this instance was much slower, taking six hours. Even so, the effect upon the patient was dramatic. In the well-described cases not treated with antivenene referred to in the literature, the gradual disappearance of the symptoms appears to be the usual feature; frequently symptoms last a week or more. The comparatively abrupt disappearance of symptoms after antivenene therapy may be accepted as a response to the treatment. Dr. Saul Wiener, with whom the writer has discussed this case, agrees with this viewpoint.

Acknowledgements.

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Summary.

A case is recorded of a patient with typical symptoms from red-back spider (*Latrodectus hasseltii*, Thorell) bite with response to antivenene therapy given 80 hours after the bite. The symptoms disappeared over a period of six hours. It is concluded that this therapy may be effective if given up to 80 hours after the infliction of a bite.

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[2] Dr. S. Wiener, in a personal communication, has commented as follows: "In the case reported by Fraser and myself we used 1000 units of rabbit antivenene. It was the first antivenene which we had prepared and as usual in these cases we tried the rabbit first. When we prepared antivenene in the horse we diluted our concentrated antivenene to 500 units per dose in order to obtain a maximum supply of the product."

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Reviews.

Biochemical Aspects of Neurological Disorders. Edited by J. N. Cumings, M.D., F.R.C.P., and M. Kremer, M.D., B.Sc., F.R.C.P.; 1959. Oxford: Blackwell Scientific Publications Ltd. 8½" × 5¼", pp. 240, with illustrations. Price: 37s. 6d.

THIS book is edited by a professor of clinical pathology (Dr. John Cumings) and a consultant neurologist (Dr. Michael Kremer), both from the National Hospital for Nervous Diseases, Queen Square, London. This at once sets the pattern for the book and guarantees its excellence. It consists of a series of lectures given by nine biochemists (six of whom, it is interesting for Australians to note, are of professorial rank) and 10 clinicians, chiefly consultant neurologists (none of whom are professors of their subject).

It is obvious that much must remain unwritten in a book of small compass (221 text pages), whose format is determined by a series of lectures delivered by 19 teachers at the National Hospital, Queen Square, during 1957 and 1958. This applies particularly on the biochemical side. However, this point is an advantage for the bulk of readers, and only very rarely is the writing obscure. Further, although this is not ostentatiously stressed, the text manages to imply the immense amount of work which underlies almost every sentence. A much greater amount which is still to be done, in order to understand fully even the simplest clinical manifestation, is always implicit, if not stated; and the reader is left with the impression that no one in the group is content to rest upon his laurels, which augurs well for future advances. Indeed, even now, two years later, the frontier of knowledge has advanced. The increase of knowledge, and our lack of it, are well illustrated by the chapter on the vitamin B group of disorders. Deficiency of thiamin deprives the nerve cell of its vital energy supply by halting glucose metabolism at the pyruvate level, probably owing to interference with enzymes concerned with the degradation of pyruvate. However, the precise mechanism by which it affects the nervous system is not known. Neuronal failure may be a direct consequence of vitamin B_1 deficiency, or a toxic effect of pyruvate accumulation. Difficulties also exist on the clinical side, for one of our most astute neurologists has stated that the cause of 56% of 44 cases of polyneuritis remained undetermined. The author of the clinical chapter (J. D. Spillane) deals very informatively with the history of our knowledge of vitamin B group disorders, going back to 1630 when Jacob Bontius gave an account of "a particular type of Palsy, called The Barbiers (Beri-Beri)" from which Bontius himself had suffered in the East Indies.

It is impossible to do more than indicate the field covered by the remainder of the book in a review of this size. The chapters cover demyelination, disorders of lipid metabolism, porphyrin disorders, calcium, phosphorus and copper metabolism, coma, anoxia and hypoglycæmic states, pituitary and adrenal disorders, and biochemical and clinical aspects of disorders of muscle. Undoubtedly the apparent lucidity will vary with the basic knowledge of the reader, and detailed criticism of the biochemical data must be left to those who are intimately familiar with the various aspects. To the ordinary reader the book is very informative, and it is to be hoped that this review will stimulate many to read the book.

Anatomy: Regional and Applied. By R. J. Last, M.B., B.S. (Adel.), F.R.C.S.; Second edition; 1959. London: J. & A. Churchill Ltd. 9¼" × 6¼", pp. 758, with 372 illustrations. Price: 80s.

THE approach to the study of anatomy as used in this book has been formulated by the author's contact with post-graduate students at the Royal College of Surgeons, England. No doubt these students have an immediate interest in acquiring knowledge sufficient to pass an important examination. They also have a long-term interest in acquiring anatomical knowledge which will stay with them, and which they will be able to apply in their future practice of surgery. This book is written to achieve these objectives, and particularly with emphasis on acquiring knowledge that will last. A lot of pure anatomical detail that has no clinical application and does not illustrate fundamental principles has been carefully omitted. Here it differs from many books on anatomy.

Despite the author's desire to limit the size and scope of the book, it has been found necessary to lengthen the second edition by some 75 pages. However, over half of these have been taken up by illustrations to help those who have not ready access to dissected parts—an addition which will be helpful to many. The over-all presentation of the subject matter is the same as in the first edition. There is a general section giving a simple account of the various tissues of the body, followed by some general observations on the nervous system, early embryology and the anatomy of the child. Anatomical structure is then discussed under the regional subdivisions familiar in dissecting rooms—the limbs, the thorax, the abdomen, the head and neck. This appeals as being more practical than description of isolated systems.

This book will be greatly appreciated by those whose learning and acquisition of knowledge are facilitated by exposition of method and understanding of principles, rather than by the listing of a great mass of anatomical detail.

Electrocardiographic Techniques: A Manual for Physicians, Nurses and Technicians. By Kurt Schnitzer, M.D.; second edition, 1960. New York and London: Grune and Stratton. 8¾" × 5¾", pp. 126. Price: $4.75.

THE subtitle of this little book, "A Manual for Physicians, Nurses and Technicians", taken together with the main title, gives a very good indication of what the author has to convey to the reader. The interpretation of an electrocardiogram has been the subject of many texts of varying complexity; but the practical details of making an electrocardiogram are usually included only incidentally. Interpretation is the last of a series of steps, which starts with the preparation of the patient and the using of the electrocardiograph. These initial steps are frequently left to a technician, whose skill and knowledge of the procedure can make or mar the investigation.

The author introduces his subject with an elementary account of the surface anatomy of the heart and the effect of posture on its position in the thorax, and follows this with a few notes on cardiac electrical activity. He then discusses the features of the electrocardiograph, the meaning and use of its various controls and the hazards which may occasionally be associated with its operation. Then follow

notes on the preparation of the patient. These points are well illustrated by clear diagrams and photographs.

A chapter is devoted to distortions (artefacts) seen in electrocardiograms, the recognition of their causes and methods of eliminating them. The author makes the important point that a skilled operator must have some acquaintance with the normal electrocardiogram in its various leads; otherwise he may try to eliminate some abnormality believing it to be an artefact, and vice versa. Confusion between fibrillation waves and muscle tremor is an example quoted.

Methods of mounting and filing tracings are also considered. Short accounts are given of special electrocardiographic techniques, such as fœtal electrocardiography, œsophageal and intracardiac leads, electrocardiographic monitors and telephone transmission. Finally, some related procedures which the electrocardiograph technician may encounter are mentioned. These include phonocardiography, ballistocardiography and vectorelectrocardiography. A useful list of reference texts and and index complete the book.

This publication can be recommended as an introduction for all technicians coming to electrocardiography, and should also be useful to the medical practitioner who proposes to have his own electrocardiograph, whether or not he operates it himself.

The Essentials of Perimetry. By H. Reed, M.B., B.S. (London), F.R.C.S. (England), F.R.C.S. (C), F.A.C.S.; 1960. London, New York, Toronto: Oxford University Press. 9½" x 7", pp 204, with many illustrations. Price: 64s. 9d.

ANY textbook which makes the study of the visual fields interesting and enjoyable is to be commended. The present book does this. It is a record of the lectures which the author delivered to students studying for the diploma of ophthalmology. He has divided the book into three parts—namely, the applied anatomy of the visual pathways, the visual field and its assessment and, finally, field defects and their interpretation. By his clear and lucid exposition all the difficulties of the practice and interpretation of perimetry have been removed, and as a result a more confident approach to the subject is engendered. His diagrams are clear and their value lies in their simplicity. The student (and, for that matter, the ophthalmologist) who knows this book will have a sound knowledge of perimetry. There is an adequate bibliography, which is a useful guide for further reading.

The book is beautifully produced, in a type which is clear and easy to read. It should prove popular amongst post-graduate students and practising ophthalmologists.

Medicinal Chemistry. Edited by Alfred Berger; second edition, 1960. New York, London: Interscience Publishers. 10" x 6¾", pp. 1262. Price: $37.50.

THIS volume offers an almost encyclopædic coverage of the field of the chemistry of compounds used in the treatment of disease. Naturally, there are so many of these that only relatively brief mention can be made of the less important ones; but for those of greater significance, considerable details are given. In addition, profuse lists of references are available after each chapter, in some to the number of several hundred.

Drugs are classified according to function, with a chapter devoted to major drug-types such as analgesics, cholinergics, diuretics, steroid hormones, etc. In addition, the first nine chapters are concerned with the general principles of methods of study, relationships of structure to function, and metabolic antagonism.

The Psychological Report: Use and Communication of Psychological Findings. By Walter G. Klopfer, Ph.D., with a foreword by Leopold Bellak, M.D.; 1960. New York and London: Grune & Stratton. 8¼" x 5¼", pp. 156. Price: $4.50.

AT a time when there is a good deal of spirited controversy concerning the most desirable and profitable relationship between psychiatrists and clinical psychologists, this book provides a concise, useful summary of the psychologist's role in the specific area of psychometric testing. It is clearly intended primarily for the student in clinical psychology and for his teachers, but makes many points of value to the psychiatrist and should be a substantial stimulus to those few reactionaries who still reject out of hand the invaluable light which skilfully administered and interpreted psychological tests may throw on many clinical problems.

The author, on the basis of his extensive experience and international reputation, shows how the well-trained psychologist can illuminate both the patient's assets and personality strengths as well as his pathological condition, and makes detailed suggestions concerning the most useful focus, style and organization of the resultant report. Preference is stated for "the scientific report which emphasises accuracy, lack of ambiguity, individuality and objectivity . . .", and the use of psychological "jargon" is repeatedly criticized. We heartily endorse his strong plea that the psychologist should be used as a "clinical consultant" with due regard to his own unique fields of competence; there is no place in psychiatry for a pure "psychometrician", and the psychologist is of greatest value as a team member when allowed to select his own "battery" and to promote whatever viewpoint of the patient seems to him to be the most profitable. "Blind" testing in routine clinical practice is heartily, and correctly, condemned.

There are a surprising number of misprints in this small and generally well-produced volume; of these, in a book with a substantially psychoanalytical orientation, "tangenital" for "tangential" has the highest shock value.

Facing Retirement: A Guide to the Middle Aged and Elderly. By A Country Doctor, M.A., M.D., with a foreword by J. W. Robertson Scott, C.H., M.A. (Hon.), Oxon.; 1960. London: George Allen & Unwin Ltd. 8¼" x 5¼", pp. 128. Price: 12s. 6d. (English).

THIS a very good book. It has good large print, is clear, concise and easy to follow, and is based on wide experience. It will also be valuable to those responsible for the care of old people. We can endorse the remarks of J. W. Robertson Scott made in his preface: "An ideal gift for anyone in the fifties and sixties." Robertson Scott writes not only the preface but also the last chapter, "Looking Backwards and Forwards at 94", which is well worth reading.

The anonymous author has divided his chapters very well, and has kept his descriptions and advice simple in character. As the book was written in Britain, the financial advice, that referring to pensions and some of that referring to annuities applies only in that country. The advice on investment and the importance of keeping control of one's money is of general application.

Some figures given in the first chapter are rather startling. The author states: "In this country more than 1000 people reach pensionable age every day and it is estimated that at present they total more than six millions. By 1980, when those now in their middle forties will be retiring they are expected to number between nine and ten millions." With modern therapeutics steadily lengthening the span of life, one cannot help wondering what the future holds for the young taxpayer.

The author has had much experience with older patients, and his considerable interest in geriatric problems is demonstrated by the several papers and addresses which he has presented on this subject. In Chapter 5 he gives very good advice on the important subject of wills. He discusses a wide variety of subjects, including the pros and cons of living alone, and points the way to lessening the tension that may arise when an "oldster" lives with a family. He gives good common-sense advice on the various physical ills, such as foot disorders, heart disease, abnormal blood pressure, etc., and outlines a suitable diet.

This book contains a wealth of good advice to anyone approaching retirement.

Peptic Ulceration: A Symposium for Surgeons. By Charles Wells and James Kyle, M.B., M.Ch., F.R.C.S., F.R.C.S. (I.), with a foreword by Lester R. Dragstedt; 1960. Edinburgh and London: E. and S. Livingstone Ltd. 9¾" x 6¼", pp. 272, with 44 illustrations. Price: 42s.

THIS book sets out to present "recently acquired knowledge and change in practice within the more lightly sketched framework of what is generally agreed concerning gastric and duodenal ulceration". Excluding the appendix (which comprises "English Translation of Early German Contributions to Gastric Surgery"), the book is divided into 13 sections. The last three sections, by R. B. Welbourn, are on "Alimentary Functions", "Delayed Complications" and "Recurrent Ulceration following Gastric Operations". These sections highlight the book. They are well balanced, well informed, well presented and well illustrated. The book is worth buying for these chapters alone. Welbourn's opening paragraph is a very fair summary of the present position of surgery from the patient's viewpoint. Proponents of the Pólya type of procedure might, however, point out that many of the delayed complications are the results of errors in technique (producing afferent or efferent loop obstruction) rather than inherent in the Pólya method of anastomosis itself.

Also quite sound, though perhaps not on quite the same plane of excellence, are the sections on epidemiology,

ætiology, pathology, perforation, bleeding and stenosis. However, these constitute a "lightly sketched framework" and present little new.

In regard to the chapters by Professor Wells, the reader is at a loss to know whether they are written for trainee surgeons or for established surgeons. Carried away by so much theory, trainee surgeons may well be induced to carry out procedures of which the experienced practical surgeon would probably feel very wary. If Professor Wells has written for established surgeons, the book will certainly make them think and reassess their procedures; but we believe that they will find little in what is new and original to induce them to change their methods along the new lines suggested. Wells gives a good description of the Pólya procedure (though some might not agree about the length of the jejunal loop). Inferences and argument regarding the afferent loop syndrome (and its relation to the anatomy in the region of the ligament of Treitz) are manifestly sound. The good results of the Hermon Taylor technique support this. On the other hand, in carrying out a Pólya procedure any surgeon to achieve success must take into account variations from the average in his patient's anatomy in this region.

The methods of closure of the difficult duodenal stump advocated are sound. Anastomosis to the gall-bladder is a contribution, though one cannot but have some doubt whether, in difficult cases, this would be easier than closure of the duodenal stump. There seems to be an attempt at times to add a procedure to an unsatisfactory operation to make that operation more suitable (for example, vagotomy with *Roux en Y* anastomosis to avoid recurrent ulceration, and vagotomy with Wells's operation to avoid some of the disadvantages of an ordinary Billroth I procedure). It would perhaps seem wiser to start off by doing a more satisfactory proven initial procedure.

This book accomplishes what it sets out to do and makes very good reading, though it contains a considerable amount of controversial matter.

Fluoridation: Errors and Omissions in Experimental Trials. By Philip R. N. Sutton, D.D.Sc., L.D.S.; 1960. Melbourne: Melbourne University Press. 8½" × 5½", pp. 148. Price: 12s. 6d.

THE first edition of this book was brought out in 1959. Some critics appear rather to have overstated their case, and the author has taken the occasion to bring out a second edition, which is the first amplified by the addition of Part 3, a reprint of the reviews in dental journals with Sutton's review of their reviews. Perhaps a middle position might be taken; we might recommend on the one hand fluoridation of water, and on the other some further observations on its efficacy. One is rather surprised to find that the body, or rather teeth, may be able to detect the difference between natural and artificial fluoride at a concentration of one in a million.

The Placenta and Fetal Membranes. Edited by C. A. Villee; 1960. Baltimore: The Williams and Wilkins Company. 9¾" × 5¾", pp. 414, with illustrations. Price: £5 10s.

THIS excellent book is divided into three sections. In the first, the whole subject is reviewed by eight different authors of world renown. Each author correlates the recent literature in order to give the present-day picture. In the first chapter, on "Comparative Aspects of the Hormonal Functions", evidence for the production of placental hormones is reviewed and hormonal gland interrelationships are described. Histophysical considerations highlight the need for revision of our present concepts. The placental circulation comes under exceedingly complete review and is well illustrated. The chapter concerning the placenta as the fœtal lung presents many previously unpublished new thoughts. The chapter on antibody transmission is full of thought-stimulating material, and highlights the gap existing between our knowledge of rodents and man. The transfer of electrolytes, vitamins, nucleic acids, carbohydrates, fats and proteins is reviewed. The selective biochemical abilities of the placenta are well dealt with by the editor himself, and in the chapter on pathology there is a complete summary of present-day placental pathology. Each of these eight chapters ends with a long list of references.

The second section of the book reports a conference on the placenta held in November, 1958, at Princeton, N.J. Thirty-five eminent investigators took part with well-illustrated contributions. Interest ranged from electron microscopic studies through biophysics and histochemistry to steroid metabolism. The majority of evidence on the last-mentioned section strongly supported an adrenal function of the placenta. The source of fœtal urine was argued. Comparative workers stressed the great differences in placental biochemistry and transport systems throughout the whole class of vertebrates. Newer methods are awaited for further progress.

The third section is a bibliography of all material published since 1946 through to the latter part of 1958. Not only are more than 2700 references given, but each one is accompanied by a short summary, so that the investigator in the placental field is indeed fortunate to have such a useful and up-to-date reference library. This book should be in every thinking obstetrician's library.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Psychoanalytic Concepts of Depression", by M. Mendelson, M.D.; 1960. Springfield, Illinois: Charles C. Thomas; Oxford: Blackwell Scientific Publications Ltd.; Toronto: The Ryerson Press. 9" × 6", pp. 180. Price: 52s. (English).

"Parkinsonism: Its Medical and Surgical Therapy", by Irving S. Cooper, M.D., Ph.D., F.A.C.S.; 1961. Springfield, Illinois: Charles C. Thomas; Oxford: Blackwell Scientific Publications Ltd.; Toronto: The Ryerson Press. 11" × 8½", pp. 250, with many illustrations. Price: £6 12s. (English).

"Atlas of Anatomy and Surgical Approaches in Orthopædic Surgery: The Lower Extremity", by R. Consentino, M.D., with a preface by C. B. Larson, M.D.; 1961. Springfield, Illinois: Charles C. Thomas; Oxford: Blackwell Scientific Publications; Toronto: The Ryerson Press. 11" × 8½", pp. 274 with many illustrations. Price: £5 12s. (English).

"The Control of Disease in the Tropics: A Handbook for Medical Practitioners", by T. H. Davey and W. P. H. Lightbody; second edition, 1961. London: H. K. Lewis & Co. Ltd. 9¼" × 6¼", pp. 432 with illustrations. Price: £2 7s. 6d. net (English).

"L'Énurésie: Étude clinique, diagnostique et thérapeutique", by Dr. Michel Soulé and Dr. Nicole Soulé; 1960. Paris: Presses Universitaires de France. 9" × 5½", pp. 136. Price not stated.

"Official Records of the World Health Organization, No. 105: The Work of WHO, 1960", by the World Health Organization; 1960. Geneva: World Health Organization. 11" × 8½", pp. 234. Price: 10s.

"References to Australia in British Medical Journals prior to 1880", by Ann Tovell and Bryan Gandevia; 1961. Medical Society of Victoria: Museum of Medical History. 10" × 8", pp. not numbered. Price not stated.

"Specifications for Pesticides: Insecticides, Rodenticides, Molluscicides, Herbicides, Auxiliary Chemicals, Spraying and Dusting Apparatus", by the World Health Organization; Second edition; 1961. Geneva: World Health Organization. 9¼" × 6¼", pp. 524 with 31 figures. Price: £2 10s.

"Rehabilitation of Hand Function", by A. N. Leont'ev and A. V. Zaporozhets. Translated from the Russian by Basil Haigh, M.A., M.B., B.Chir., and edited by W. Ritchie Russell, C.B.E., M.D., D.Sc., F.R.C.P.; 1960. Oxford: Pergamon Press Ltd. 9¼" × 6", pp 214 Price: 60s. net (English).

"Recent Advances in Human Nutrition: With Special Reference to Clinical Medicine", by J. F. Brock, D.M. (Oxon.), F.R.C.P. (Lond.); 1961. London: J. & A. Churchill Ltd. 8" × 5¼", pp. 464 with illustrations. Price: 50s. (English).

"Midwifery", by Ten Teachers under the direction of F. W. Roques, C.B.E., M.D., F.R.C.S., F.R.C.O.G.; edited by F. W. Roques, J. Beattie and J. Wrigley; tenth edition, 1961. London: Edward Arnold. 8¼" × 5¼", pp. 748, with a few illustrations. Price: 45s. net (English).

"Gynæcology for Students", by Lance Townsend, M.D., B.S., F.R.C.S. (Edin.), F.R.A.C.S., F.R.C.O.G., D.T.M. & H.; 1961. London and New York: Cambridge University Press. 9¾" × 6", pp. 340, with illustrations. Price: 63s.

"Section Cutting in Microscopy", by H. F. Steedman, Ph.D.; 1960. Oxford: Blackwell Scientific Publications Ltd. 9" × 5¾", pp. 178, with a few illustrations. Price: 20s. (English).

"Psyche and Hormon", by H. Meng, Professor Dr. med., C. A. Joël, Dr. med. et phil., P. Parin, Dr. med., H. Selye, Professor Dr. med. et phil. et sc., F. G. Sulman, Professor Dr. med. et med. vet.; 1960. Bern and Stuttgart: Hans Huber. 9¼" × 6¼", pp. 504, with illustrations. Price: DM 78.

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HOME, MARRIAGE AND THE FAMILY.

HOME, marriage and the family have always been fruitful subjects of discussion for the cynic and the sentimentalist, the thinker and the dogmatist, the saint, the psychologist and the man in the street. Every age and culture and passing thought-fashion has produced its own patterns and conventions, seeking to cast these domestic eternals into its own mould. In our modern age the pattern is to analyse them, organize them and subject them to such a variety of improving techniques that one sometimes trembles for them. Somerset Maugham in a famous story has emphasized the view that only a razor's edge separates such contrasting attitudes as love and hate. On the same principle, it may not be a far cry from an over-solicitous, quasi-scientific obsession with the simple human institutions of our discussion to the reversed values of Aldous Huxley's *Brave New World*, where strong emotions are "horrible", "mother" is a smutty word, promiscuity is required by social convention and "the appalling dangers of family life" are recalled from history only to be shuddered at. From all this we may pray, and reasonably hope, to be spared, but the thought is something of a warning—that we should retain straightforward human attitudes towards straightforward human things.

The over-ruling and consoling thought about the attention paid to home, marriage and the family by everyone from the scientist to the satirist is that all recognize, implicitly if not explicitly, that these are keystones in the structure of society and human happiness. If they fail, the whole building is in danger. They therefore concern us all, and their preservation on a common-sense healthy basis is the more likely to be ensured if a diversity of people and groups in the whole community think about them, especially if they think about them together. For this reason it is pleasing and reassuring to note that the National Marriage and Family Week being held in Australia from May 8 to 14 has a wide sponsorship from civic and social organizations, from the churches, from educational bodies and from government departments. Its broad aim is to focus attention on the importance of marriage and the family. To this end local organizations and churches have been asked to plan special projects within their own district and, together with central committees in the various States, to:

1. Urge that the welfare of the family receive primary consideration in our society.
2. Help families to achieve true harmony together and to contribute to the life of the community.
3. Help men and women to appreciate the nature and responsibilities of modern marriage.
4. Offer young people instruction and guidance designed to foster sound and fulfilling man-woman relationships.

Every one of these aims is likely to touch the practising doctor in the course of his professional activities, and certainly should concern all medical men and women as specially informed citizens. Few if any of us would question the importance of the family and so of its welfare in society. In this age of social legislation and social organizations we should be concerned not only that the family in all its aspects is provided for, but that the best kind of provision is made. This may well mean something more, perhaps something other, than what can satisfy the shallow requirements of the Welfare State. In the light of the increasing number of millions of pounds that go into the provision of cheap drugs as pharmaceutical benefits, we may well ask if comparable sums are being spent in the interests of preventive medicine and positive health, and if the persistent apathy of our Federal Government towards the vital matter of rehabilitation can be justified.

The doctor's contribution to the second and third aims—to help families to achieve true harmony together and to contribute to the life of the community, and to help men and women to appreciate the nature and responsibilities of modern marriage—is more likely to be indirect than direct. He may of course have opportunities, as citizen or as doctor, to join the various organizations and share in the campaigns and lectures designed to guide and educate the community in these matters; according to his time and capacity, he perhaps has an obligation in this regard. However, especially in general practice, these aims are linked with the background of life which any adequate view of medicine must take into account. Incidental to the daily round of calls and consultations, opportunities will arise not only to attempt to sort out and solve personal and family problems brought forward by patients, but more importantly to spot early difficulties and to dispel ignorance and misunderstanding before they breed problems. In this regard especially, if the slicker forms of group practice fail to provide a "family doctor" type of service, then they fail fundamentally in providing essential medical care.

The fourth aim—to offer young people instruction and guidance designed to foster sound and fulfilling man-woman relationships—will leave some doctors guessing and even, curiously enough, embarrassed. Most will appreciate the importance of such instruction and guidance, but how to go about imparting it is another matter. Medical schools do not usually include it in their curricula, more's the pity, but it is surely wrong that it should be left to the mercy of every agency except the medical adviser. Not that we would deride the admirable and devoted work being done in this field by non-medical people, especially in such organizations as the Father and Son Movement

and various marriage guidance bodies, but it is very much the responsibility of the doctor as part of his day-to-day practice. For this reason we are glad to publish in this issue Dr. W. L. Carrington's thoughtful article on the subject (see page 670). Based on wide experience, it should provide at least a starting point for the doctor who is prepared to accept this responsibility.

That trenchant critic of life Samuel Johnson—who had himself been devoted to an unprepossessing wife, twenty years his senior but now long since dead—said in his later years (if we may believe Boswell's record):

> Sir, it is so far from being nature for a man and a woman to live in a state of marriage, that we find all the motives they have for remaining in that connection, and the restraints which civilised society imposes to prevent separation, are hardly sufficient to keep them together.

The logic of this statement is open to question, but like most half-truths it at least stimulates us to think about the problem revealed. All sustained close human relationships can be difficult from time to time, if not all the time. Marriage involves such a relationship, unless it is downgraded to what Robert Louis Stevenson has described as "no more than a sort of friendship recognized by the police". And family life lags little behind. Anything that our profession can contribute to the resolution of the attendant difficulties will be a contribution to the common good.

Current Comment.

FAREWELL THYROID B.P.

IT has been suggested that "thyroid B.P." could now be usefully deleted from the next edition of the British Pharmacopœia because *l*-thyroxine should be used in its place, *l*-thyroxine, 0·1 mg., being equivalent to thyroid B.P., one grain.

Although wonder drugs are commonplace in modern medicine, we might remember that thyroid was one of the original wonder drugs. Veritably it worked miracles. Sir William Gull, who recorded the best description of "the cretinoid state supervening in Adult Life in Women", pointed out how the gross changes of myxœdema occur as a change from the previously fine-featured, well-formed and active state of the sufferer. He went on to describe a severe case, the like of which we are unlikely to see, and stated the hopeless prognosis. Four years later, in 1878, Ord showed that myxœdema was due to thyroid insufficiency; twelve years later Bettencourt and Serrano successfully grafted thyroid tissue into a human sufferer from thyroid insufficiency. The next important development was in 1891, when Murray reported the successful use of subcutaneous injections of thyroid extract. The next year the efficacy of thyroid by mouth was recorded. In 1920, Murray had the considerable satisfaction of recording in the *British Medical Journal* the life history of the first patient with myxœdema treated by thyroid extract. The woman came under treatment when 42 years old, and her myxœdema was well controlled till she perished at 74 years of age, from an unrelated ill. During her life she was calculated to have used the thyroids of more than 870 sheep. In passing, Murray mentions the difficulties of a colleague who had no success with his thyroid therapy till he discovered that his butcher was supplying thymus instead of thyroid gland.

In a Special Article in a recent issue of *The Lancet* G. McGregor,[1] Regius Professor of Materia Medica and Therapeutics in the University of Aberdeen, asks "Why does anybody use thyroid B.P.?". He leaves us in no doubt that there is no good reason why anybody should use thyroid extract. Clearly *l*-thyroxine will do all that thyroid extract will do without the very great difficulty of obtaining a satisfactory and standard biological assay of its potency. Thyroid extract can lose considerable potency if stored for any length of time. (Thyroxine itself may suffer to a lesser degree from this drawback. Hence the recommendation that the date of manufacture should be stamped on the containers of thyroid extract at least.) Finally the Regius Professor from Aberdeen carefully considers the subject of cost, because this has been suggested as a reason to prefer thyroid extract. The answer is that by using *l*-thyroxine for a patient, the Health Service in the United Kingdom would be twopence a week poorer.

McGregor ends with this peroration: "There is ample pharmacological, therapeutic, and economic justification for recommending that thyroxine be used for all thyroid replacement therapy, to the exclusion of preparations of dried thyroid, including thyroid B.P."

[1] *Lancet*, 1961, 1: 329 (February 11).

REHABILITATION PROGRAMME OF MOROCCAN PARALYSIS VICTIMS.

As an example of the way in which medical help on an international scale can be mobilized in today's world, it is instructive, as well as heart-warming, to peruse the study, by G. Gingras and M. H. L. Desmarais,[1] of the response by WHO and the League of Red Cross Societies to the Moroccan Government's recent appeal for help. When ten thousand of its ten million people were inexplicably stricken with paralysis late in 1959, one of the largest peace-time rehabilitation operations ever undertaken was inaugurated within weeks of the catastrophe, and 15 countries, through such agencies as U.N.I.C.E.F., combined to send funds, equipment and personnel.

The clinical picture of the paralysis was that of an acute peripheral neuritis, varying in severity from a moderate affliction to quadriplegia, and affecting exclusively the "Moslem Moroccans of the artisan class", mainly the women and children.

The incrimination of tri-ortho-cresyl-phosphate as the causative agent was effected by two British experts within a month of the outbreak of the "epidemic". They found that a large quantity of lubricating oil containing this substance had been sold by the United States Air Force to a Moroccan dealer, by whom it eventually was sold to a group of merchants who used it to adulterate locally-sold, cheap cooking oil. Because the European and wealthy native population could afford a better class of oil and the very poor had no oil at all, while the Jewish community was supplied with oil from its own supervised markets, the native middle class bore the brunt of the tragedy. The women and children, who consumed more oil by virtue of eating all their meals at home, were principally affected. Tri-ortho-cresyl-phosphate has been held responsible for previous outbreaks in other parts of the world, but never on such a staggering scale.

Professional rehabilitation personnel from 15 countries were sent by the League of Red Cross Societies to treat the victims and train local staff, and within six weeks of the inauguration of the operation, nearly 7000 patients had been examined. Group therapy was adopted, since individual treatment was obviously impossible. Four outdoor and two indoor hospital rehabilitation centres were established, with the possibility of more to come, each with an international staff. Transport of the patients to and from the centres was, when possible, by government vehicles. Approximately 1000 children and 600 incapacitated quadriplegics are to be housed in a converted military establishment, where schooling can be supplied.

[1] *Arch. phys. Med.*, 1960, 41: 559.

Ten-day short training courses were given to 250 physical therapy aides, and a 12-month training course to selected Moroccan nurses who will eventually replace the foreign staff in the long-term treatment centres.

The authors of the study are lyrical in their praise of the "speed and volume of the international aid" that came to Morocco. The figures quoted sound most impressive, but it behoves us, surely, as medical men, to beware of a virtuous complacency in beholding the 9000 odd people who can be and are being helped while several hundreds are totally disabled for life, and while the effects on the families of the victims remain incalculable. Something might also be said about the policing of health regulations in a modern community, albeit a nation not yet five years old, in which such a state of affairs can come about.

IS NEUROLOGY DESTROYING ITSELF?

WE were intrigued last year to read an abstract[1] of the presidential address to the New York Neurological Society delivered on October 13, 1959. Entitled "Some Neurosurgical Asides on the Self-Destruction of Neurology", it was delivered by Fritz Cramer, an eminent neurosurgeon. The address was not published in full, so we secured a copy from Dr. Cramer. Twenty years ago, he writes, the discipline of clinical neurology had been based on a painstaking inquiry into the development of the symptoms, combined with a careful examination. Today it is not fashionable to rely on the pursuit of pure neurology, despite the elegance of the human body and its relatively predictable manner of functioning, and despite the simplicity of the neurological examination where, by questioning the patient and applying our senses in the physical examination, we can usually arrive at a reasonable diagnosis.

> We now feel impelled to grade all facts against a battery of scientific titrators. Until the patient has undergone a trial by fire, his symptoms will not be accepted at face value. If the data do not conform to a predetermined statistic, they are discounted. If the clinical data are not confirmable by roentgen procedures or other tests, they are apt to be ignored as true facts. Yet, the technical fallibility of the contrast studies and their frequent futility, if they cannot be interpreted by absolute experts, and the dangers of untoward complications, are passed over lightly.

Cramer mentions the prevalent danger to a patient who gives symptoms like those of an early temporal lobe tumour. By the ordinary course of clinical shunting he finds himself in the psychiatrist's domain and if, besides his behavioural disturbances and hallucinations, he also has a mother on whom he depends for help and comfort, he is apt to have all clinical studies forbidden. If the true neurological discipline is to survive, it can brook no technical substitutions. It is true that new methods permit us now to diagnose and treat many conditions which otherwise would remain undiagnosed. But the assets and gains of the mechanical age have been accompanied by methods of teaching and thinking which are self-destructive of the basic discipline.

Cramer instances his pity for a brilliant young neurological trainee, who had to leave a luncheon table early, "glowing with the excitement of being about to consummate a first great adventure. He explained that he was going to perform his first arteriogram!". A practitioner referring a patient for a neurologist's opinion, Cramer states, is not satisfied with the answer that the result of the examination was "negative" or inconclusive, or that myelography or arteriography or encephalography should be done. What he wants is a good clinical examination and the expression of an opinion. The substitution of radiology may be unavoidable and necessary in towns with no neurologists. But when a radiological procedure is carried out primarily for simple diagnosis, rather than as part of a planned collaborative manœuvre, it represents another step in the decadence of the neurological art. The new wonders of the laboratories and of the technical arts, Cramer comments, brought into being by neurologists and neurosurgeons, have now become so attractive that they are inexorable necessities in almost every case. The neurologist forgets that the pictures do not speak for themselves, and the interpreter is not a magician. The radiologist is just another doctor who relies heavily on the clinical history and clinical findings. Here is Cramer's suggested solution:

> . . . that the curriculum of neurology, in which I include neurological surgery and psychiatry, in both its undergraduate and post-graduate phases be taught more determinedly not only as a science (based, of course, on the cellular theory), but as an art to be learned from re-emphasis on an exhaustive and chronologic history and meticulous examination, and as a craft in which the neurologist and his fellow craftsman in the ancillary services and associated disciplines work as a conjoint team, rather than as independents and competitors.

The failure of this important address to find an editor suggests "yes" as the answer to the question at the head of this paragraph. A science which censors criticism of itself is already moribund.

[1] *Arch. Neurol.*, 1960, 3: 98 (July).

"NO CONSULTATION DAY" IN JAPAN.

ON February 19, 1961, the Japan Medical Association and the Japan Dental Association sponsored a "No Consultation Day" in order to direct the attention of the population to the fact that, in spite of a Four Point Plan submitted by the Japan Medical Association to the Ministry of Welfare, the Ministry continued to ignore the needs and recommendations of the doctors of Japan. The medical fee under the Japan health insurance plan is recognized to be the lowest in the world. For example, a surgeon receives less than £4 (Australian) for a cataract operation. Hence the Japan Medical Association had requested that the Welfare Ministry release medical care under health insurance from restrictions, increase the medical fee at least 30%, decrease the annoying business routines associated with health insurance, and simplify the medical fee system by abolishing the current dual system and providing for differential fees according to area.

The recent strike of hospital employees had forced the welfare Ministry to recommend diet approval of an average increase of 14% for hospitals and 6% for clinics. This irrational discrimination between hospitals and clinics, failure of the leaders of the Liberal Democratic Party to reach an agreement with the medical and dental association representatives in spite of the fact that the special committee on medical care of the Liberal Party had endorsed the Japan Medical Association's Four Point Plan, and criticism of the Japan Medical Association by the Ministry of Welfare inspired the "No Consultation Day" demonstration. Doctors and dentists declined to accept consultations, but provided emergency care for those who required it and had an adequate medical staff at hospitals and clinics. The doctors distributed pamphlets and held public relations meetings and Press conferences on that day in order to inform the population as to the actual status of the medical care system.

The Japan Medical Association further announced that a second "No Consultation Day" would be held on March 5 and that on April 1, 1961, the doctors would withdraw their services from the health insurance plan. However, late in February at joint meetings between political leaders and representatives of the doctors and dentists, some progress was achieved toward solving the problem. The second "No Consultation Day" and the withdrawal from the insurance plan was cancelled pending further negotiations with the government. Nevertheless, the Japan Medical Association continues ready to effect "No Consultation Days" and to withdraw from the health insurance plan if the government fails to give prompt and just consideration to the problems of the Japanese doctors.

Abstracts from Medical Literature.

GYNÆCOLOGY AND OBSTETRICS.

Cancer of the Female Pelvis.

SIR HERBERT SCHLINK (*J. Obstet. Gynæc. Brit. Emp.*, June, 1960) reviews the treatment of cancer of the female genital organs at the Royal Prince Alfred Hospital, Sydney, over the past 55 years. The routine treatment for carcinoma of the cervix at this clinic since 1930 has been a preliminary application of radium in a dosage of 7000 mg. hours followed by a radical Wertheim's hysterectomy, when possible, 5 to 6 weeks later. Tabulated results are given of survival rates at 5, 10, 15 and 20 years after treatment together with survival rates during the most recent five-year period, compiled in December, 1958. Five and 10 year survival rates for carcinoma of the corpus uteri for the years 1930 to 1953 are also presented. In the R.P.A.H. series of 635 patients treated by radium and operation between 1930 and 1951, there was a primary mortality rate of 3·9%. The operability rate among 1488 patients examined up to December, 1958, was 54·7%. The absolute five-year cure rate of patients treated by radium plus radical surgery between 1930 and 1946 was 55·3%. The survival rate of patients treated in the most recent five-year period available by radium and/or surgery was 61·3%. Classification in each table is made according to the type of treatment and the stage of neoplasm. These tables indicate the importance in prognosis of the stage of the carcinoma when examined, the advantages of treatment by combined radium and radical surgery, the reduction of cure and survival rates when patients are followed beyond 5 years to 20 years and an over-all improvement in results during the most recent five-year period. Patients are also classified according to the nature of the cervical neoplasm, squamous carcinoma or adenocarcinoma. Survival rates at all intervals from 5 to 20 years were better in cases of squamous carcinoma. Among patients submitted to operation, 18% to 21% showed lymph node involvement. The poor prognosis of patients with gland involvement is apparent. An analysis of 465 patients with carcinoma of the body of the uterus showed an operability rate of 78·5% and an operative mortality rate of 2·5%. Those patients with carcinoma of the body of the uterus who were treated by radium and surgery or by surgery alone had a five-year survival rate of 72·4% and a ten-year survival rate of 56·4%. The author and his colleagues are convinced that the best method of treatment of carcinoma of the cervix is to clear the ulceration of the cervix with preliminary radium application and follow this with radical surgery 5 to 6 weeks later, when possible. The earlier the treatment, the better the result. Hence, the energy of the staff is concentrated on measures to achieve early diagnosis. Cytological examination of vaginal smears and colposcopy are extensively used in this direction.

Adenoacanthoma of the Uterine Body.

W. CHANEN (*J. Obstet. Gynæc. Brit. Emp.*, April, 1960) reports a clinical and pathological study of 42 cases of adenoacanthoma among 180 patients with carcinoma of the uterine body at the Royal Women's Hospital, Melbourne, during the period 1950 to 1957. Adenoacanthoma is defined by Willis as an adenocarcinomatous tumour of the uterine body in which islands of squamous epithelium occur. The extent of the squamous component varies in different tumours. The author states that there is no unanimity concerning the origin of the squamous component, the degree of malignancy of these tumours, their incidence and their radiosensitivity. Chronic infections or hormonal influences could possibly stimulate a direct transformation from the lining epithelium or stroma to squamous tissue formation. The incidence of adenoacanthoma in this series was 24% of all endometrial carcinomas. The patients conformed as regards age, symptoms and parity to those with adenocarcinoma of the uterine body. The routine treatment of these patients comprised intracavitary irradiation with radon followed by surgery. When possible the surgery was radical, and 48% of the patients were treated by Wertheim hysterectomy combined with pelvic lymphadenectomy. Poor-risk patients or those presenting technical difficulties were treated by total hysterectomy and bilateral salpingo-oophorectomy. Irradiation alone was given to nine patients considered unfit for surgery. Two of this last group have survived for over five years. The operability rate of the series was 74%. The three-year survival rate of patients with adenoacanthoma was 59% and that of patients with adenocarcinoma was 73%. Of those with adenoacanthoma, 24% were found to have metastasis in one or more sites, the ovary being a common site. The incidence of lymph node involvement was high, being 20%, which compares with 7% for patients with endometrial adenocarcinoma submitted to lymphadenectomy. The histological pattern of metastases was sometimes similar to that of the primary growth, but in others one or other component predominated in the metastases. The author concludes that adenoacanthoma is more frequent, more malignant, metastasizes more readily and is more radiosensitive than is generally believed.

The Prognosis of Adenoacanthoma of the Corpus Uteri.

G. C. LIGGINS AND S. WAY (*J. Obstet. Gynæc. Brit. Emp.*, April, 1960) report the results of treatment of 32 cases of adenoacanthoma and 124 cases of adenocarcinoma of the corpus uteri at the Queen Elizabeth Hospital, Gateshead. They state that views on the malignancy of adenoacanthoma vary widely. Way, in 1951, had recorded a high rate of vaginal metastases in adenoacanthoma compared with that of adenocarcinoma. The opposite view has been held by some other writers, who state that the presence of acanthosis in fundal adenocarcinoma is an excellent prognostic sign. During the period 1940 to 1953, 156 patients with carcinoma of the corpus uteri were seen; 32 of these had adenoacanthoma. Of these, 139 were treated either surgically or by intracavitary radiation. Cases were classified as "early" when the growth was limited to the corpus uteri, irrespective of its size, and "late" when the neoplasm had spread to the cervix, peritoneum, vagina or elsewhere. The relative five-year survival rate for adenocarcinoma was 54·5%, and for adenoacanthoma was 27·6%. The five-year survival rate in "early" cases was 69% in patients with adenocarcinoma and 43% in those with adenoacanthoma. Among "late" cases there was a salvage rate of 14% in patients with adenocarcinoma and no survivals among those with adenoacanthoma. In addition to the poorer prognosis of adenoacanthoma in both "early" and "late" cases, the authors note that surgery produced better results than radiotherapy in the treatment of both adenoacanthoma and adenocarcinoma. The authors draw attention to the fact that squamous elements in adenoacanthoma may look histologically benign but are often found deep in the stroma and are sometimes present in lymphatics and lymph nodes. They consider that there is much evidence to suggest that adenoacanthoma has a malignancy equal to and possibly greater than that of adenocarcinoma without acanthosis.

Ovarian Function after Pelvic Operation.

R. W. TELINDE AND L. R. WHARTON (*Amer. J. Obstet. Gynec.*, November, 1960) present an experimental study of changes in the ovary after hysterectomy or adnexal operations in Rhesus monkeys, which are cyclicly menstruating primates. The post-operative course was followed by laparotomy, follicle stimulating hormone determinations, and ultimately autopsy. No evidence of impairment of ovarian function was noted as evidenced by derangement of follicular or corpus luteum development, maturation or regression, nor were there any detectable ovarian stromal changes. The authors conclude that these experiments do not afford any basis to support the indiscriminate removal of ovaries in young women during hysterectomy.

Primary Carcinoma of the Vagina.

S. L. MARCUS (*Obstet. and Gynec.*, June, 1960) reports a study of 23 patients with primary carcinoma of the vagina treated at Stanford University hospitals between 1935 and 1959. He draws attention to the rarity of this disease and failure to achieve better results from modern methods of treatment. Its incidence is quoted in the literature as 0·1 to 3·9% of all female genital tract malignant lesions. The average age of patients in this series was 63·7 years, parity did not appear to be of ætiological significance, and the lesion was uncommon in Jewish and Negro women. Factors such as leucoplakia, the use of pessaries, prolapse, leucorrhœa or syphilis are not thought to be important. Painless vaginal bleeding was the outstanding presenting symptom. Primary carcinoma of the vagina occurs in three clinical types, (i) an everting or papillary form, (ii) a solitary nodulo-ulcerative form, and (iii) an infiltrating or indurated form. Histo-

logically, all in the present series were of the squamous cell type, 5 being well differentiated, 5 of intermediate differentiation and 13 poorly differentiated. No correlation was found to exist between histological differentiation and prognosis, nor was size of the lesion, *per se*, of prognostic significance. In this series the anterior wall of the vagina was the most common site. Anterior-wall lesions were predominantly in the lower third, and posterior-wall lesions were commonest in the upper part of the vagina. The author discusses the lymphatic drainage of the upper, middle and lower thirds of the vagina and states that there is a free anastomosis between the lymphatics of the upper and lower halves of the vagina and also between those of the right and left sides. Reported five-year survival rates from the literature range from zero to 60%. The absolute five-year survival rate in this series was 20%. The fear of damaging adjacent organs by irradiation therapy and the need for ultraradical surgery have probably been important in explaining unimproved results. The author considers that the prognosis depends on the dose of irradiation delivered to the tumour, the radiosensitivity of the particular lesion, and its location. Lesions in the upper half of the posterior wall appear to have a better prognosis than those in the lower half of the anterior wall. The author considers that proper surgical treatment of a lesion in the upper half of the vagina requires a Wertheim hysterectomy, pelvic lymphadenectomy, total vaginectomy and extirpation of the bladder or rectum, depending on the site of the lesion. A tumour in the lower half of the vagina requires, in addition, vulvectomy and bilateral inguinal and femoral node dissection. The view is expressed that the results of surgery do not appear to be superior to those from properly administered radiation therapy. The principles of irradiation therapy are discussed and the treatment preferred combines deep X-ray therapy in a dosage of about 6000*r* followed by radium in a dose of 7000*r* to a point 1 cm. beneath the vaginal surface.

The Management of Elderly Primigravidæ.

I. R. MACDONALD AND H. R. MACLENNAN (*J. Obstet. Gynæc. Brit. Emp.*, June, 1960) report an eight year study (1950–1957) at the Royal Maternity and Women's Hospital, Glasgow, of 662 elderly primigravidæ compared with a similar series at the same hospital 25 years ago and a control group of primigravidæ aged 25 years and under. The age of 35 years or over is taken as the criterion for the elderly primigravida. The maternal mortality rate of this series of elderly primigravidæ was 0·2% as compared with the figure of 4·5% for the similar series 25 years ago. The problem of maternal mortality in the elderly primigravida would now appear to have been solved, but perinatal mortality among infants, though improved, is far from satisfactory. The figures do not suggest that the risk of abortion is outstanding in elderly primigravidæ, but there is a much greater risk of other antenatal complications such as hypertension, anæmia and fibroids. The incidence of hypertension was double that in patients aged 25 years and under. The incidence of microcytic anæmia in the "elderly" patients was 7% compared with 2·7% in the younger group. Fibroids were present in 4·7% of the elderly primigravidæ but did not occur in the young primigravidæ. Their presence caused no difficulty in most cases. In an analysis of the series into those who were 35 to 39 years of age and those of 40 years and over, the most striking difference was an increase in hypertension from 30·6% to 45·5%. The perinatal mortality rate was 7·6% in the 35 to 39 years age group and 9% in those 40 years and over. The Cæsarean section rate was 23·2% in the early primigravidæ and 1·6% in the young primigravidæ. Although two-thirds of the elderly primigravidæ were successfully delivered by the vaginal route, the authors consider that the associated stillbirth and neonatal death rates among these patients warrant a review of this type of delivery if labour is prolonged beyond 24 hours. The high perinatal loss in elderly primigravidæ is considered by the authors to be the outstanding problem in the management of the elderly primigravidæ. The outstanding causes of fœtal death were toxæmia of pregnancy and/or prematurity (63%) and asphyxia in labour (17%). The authors conclude that the high perinatal loss suggests that all elderly primigravidæ should be admitted to hospital for assessment before term and that a more radical approach to confinement by induction of labour or elective Cæsarean section should be considered.

Management of Endometriosis with Norprogesterone.

T. B. LEBHERZ AND C. D. FOBES (*Amer. J. Obstet. Gynec.*, January, 1961) report on 112 patients with endometriosis managed with norprogesterone. Sixty of the patients had been proved to have endometriosis by previous laparotomy, culdoscopy or colpotomy. Two progesterones were used, norethindrone and norethynodrel. Dosage consisted of 10 mg. daily for two weeks, then 20 mg. daily for two weeks, then 30 mg. daily for eight months. If break-through bleeding occurred, the dosage was increased by 10 mg. daily until the bleeding was controlled; at no time did daily dosage exceed 60 mg. Biopsy specimens of endometrium, as well as ectopic endometrium from the uterus, ovaries and peritoneum, were obtained during the course of treatment. Stromal changes consisted of cytoplasmic swelling of the stromal cells as early as three weeks after treatment was begun, with progressive changes up to seven months. The endometrial glands become progressively dilated, with flattening of the epithelium and decrease in glandular elements. In a few cases the glands retained proliferative appearances. Ectopic endometrium implants undergo like changes, but no definite conclusion regarding final morphological changes in these could be drawn. Clinical and symptomatic correction occurred in 87 patients, seven patients were clinically corrected but still had symptoms, in five cases the treatment failed from the clinical, symptomatic and microscopic angles, and in thirteen cases failure was recorded because of reaction to the drugs. Side effects of treatment were mild nausea in two cases, severe nausea in two cases, mild breast tenderness in five cases and emotional distress in seven cases. Rapid growth of uterine fibroids occurred in four cases, break-through bleeding in 43 cases, and fluid retention in 56 cases. The authors consider that norprogesterone does affect ectopic endometrium favourably from the host standpoint and can be expected to produce subjective and objective relief both during and after therapy in 75% to 80% of cases. Because long-term follow-up is not yet available, and because duration of therapy is prolonged and troublesome side effects do occur, they state that use of this drug for conservative management of endometriosis should at present be restricted to patients in whom the condition is causing adverse symptoms and who are aged 35 years or less, especially if future childbearing has to be considered.

Diagnosis of Fœtal Life with Electrocardiogram.

S. LARKS *et alii* (*Amer. J. Obstet. Gynec.*, December, 1960) report on 15 cases in which the technique of fœtal electrocardiography was used because fœtal heart sounds could not be heard. Prior to the eighteenth week electrocardiography is only moderately accurate, and a "negative" fœtal electrocardiogram in this period suggests that fœtal life may be absent. Repeated recordings are desirable, since there may be 2 to 3% of "false negatives". Of 11 cases in this group, in 8 a positive result was obtained and was helpful in establishing the diagnosis; in 3 cases a negative result was obtained, 2 resulting in the delivery of a macerated fœtus and the third being a case of pseudocyesis. From the twenty-fifth to the thirty-third week the accuracy drops to about 50%, and only positive findings should be utilized. With increased accuracy towards term, high proportions of positive findings are obtained and increased reliance can be placed upon the fœtal electrocardiogram, but there are still 3% of false-negative findings. In at least two of the cases presented there was great maternal obesity, yet it was possible to demonstrate a positive fœtal electrocardiogram. The authors stress that when a fœtal electrocardiogram is positive the presence of fœtal life is certain, but that negative reports should be treated with caution.

A New Instrument for Sharp Cervical Conization.

G. W. WESTCOTT (*Arch. Surg.*, October, 1960) describes a new instrument for sharp conization of the cervix uteri. This consists of a hollow cone, open at the base, which can be attached to a standard Bard Parker scalpel by a turn of a thumb-screw. The blade lies in a slot which runs the length of the cone, so that the specimen escapes into the cone as it is cut, and is constantly visible through the open base. The slot spacing of 2 mm. procures specimens of uniform thickness, which appear like a thick graft. Blood is excluded from the cone during the cutting process because the specimen completely fills the slot as it comes off the knife edge and into the cone.

Special Article.

THE PRE-MARITAL MEDICAL CONSULTATION.

THERE seems to be a wide variation in the nature and extent of pre-marital help offered by doctors to candidates for marriage, and a need for a more coherent medical attitude and policy in this field. This article is an attempt to give a brief account of the kind of pre-marital consultation gradually evolved by the writer over the last 30 years, in the hope that it may offer a basis for further discussion and clarification.

It is not intended to suggest that such consultations can be rigidly standardized or stereotyped. What is offered will naturally depend on the apparent needs of the candidates and the attitude, ability and experience of the doctor. But they are appropriately considered in the traditional sequence of history taking, examination and treatment, with slight modifications to fulfil the particular needs of the situation.

History Taking.

History taking may begin with a general discussion of the marriage, designed to enable the doctor to gain some idea of the attitudes of the two candidates to each other, to marriage and its responsibilities, and possibly to life itself. As with history taking in general, this is an art which can be cultivated, and in which the establishment of *rapport* is important. The two people should have time to feel their way with the doctor, and to gain sufficient confidence to bring up matters about which they may have felt shy or diffident. The doctor's main contribution at this stage is to be a good "creative" listener who accepts fully the feelings that are expressed. Questions should convey genuine interest without any suggestion of prying or probing.

Beyond the conventional questions there are many which merit discussion before the wedding, some of which are suggested in Appendix I. It may be helpful for the doctor to know whether any pre-marital discussions are contemplated with a minister, marriage counsellor or other suitable person, so that he can avoid unnecessary overlapping.

Discussion of these questions may bring to light actual and potential areas of strain and conflict, so that they can be further considered before the wedding. It may also reveal immature or distorted ideas, attitudes, vulnerabilities and emotional needs in either person, many of which may be helped by further counselling or psychotherapy. On the other hand, the discussion may bring out distinctive assets and reinforce them, so that they may be further developed within the marriage.

The second part of the history taking is concerned with the personal and family history of each of the candidates. It is generally best carried out with the two people together unless they wish to participate separately. The sharing of medical histories may be valuable, and if the doctor senses any hesitation or diffidence, he can easily defer the rest of the history to the privacy of the later examination.

This pre-marital personal and family history taking is along lines familiar to all doctors, comparable with that which has been evolved by the major life assurance societies. The candidates may then be taken separately on the same or a subsequent occasion, and given an opportunity for private discussion of anything they may wish to bring up. A list of questions which might be asked at this stage by the doctor or any other suitable person is given in Appendix II. They are offered merely as a guide, to be used or omitted at discretion. They may provide the only opportunity for some young people to discuss quite serious worries with someone competent to help. For example, a young man may be deeply concerned about the size of his penis, which may have brought irresponsible comment from his colleagues. There may be concern about sexual potency, homosexual feelings, masturbation, or a close relationship between his fiancée and another woman. A young woman may be worried about the possible pain in sexual intercourse or about feelings of distaste for it. In spite of the current freedom of conversation about sexual matters, there still seems to be much ignorance and misinformation about the whole subject.

The Examination.

For the requirements of the pre-marital consultation the examination may be considered under three headings, general, genital and genetic.

The general examination of each candidate is along lines familiar to all doctors and comparable with that which is carried out for life assurance societies. It seems a wise precaution that everyone should also be encouraged to seek a routine radiological examination of the chest through the mass X-ray facilities of Health Departments.

The genital examination in men will include inspection and palpation of the scrotum as well as inspection of the penis. In appropriate cases it may also include examination of material expressed in prostatic massage and when there is any concern about potency a special examination of semen. In passing, the distribution of pubic hair will be noted, but it is rare to find any abnormality in this or in the bony structure.

The genital examination in women is generally more important, especially regarding the condition of the hymen. If this is still unbroken and seems reasonably distensible, it may be of great value to the woman if she is given directions about gradual digital self-dilatation before the wedding. In the writer's experience the results of this have been excellent as long as it has been carried out a little each day in a warm bath with the index finger. It is important that it should also be discussed with the husband-to-be, as there may be strong feelings and misunderstandings about it. By this simple procedure it seems clear that many young brides are saved from unnecessary discomfort in the early weeks of marriage and the incidence of vaginismus is materially lessened. Further genital examination is a matter for the doctor's judgement in each case, and in passing he may note the shape of the breasts and the distribution of pubic hair. He may also r tice the tell-tale striæ indicative of a previous pregnancy, which can be discussed privately with the person if it seems advisable.

The genetic examination will mainly be concerned with any relevant conditions discovered in the history taking, and in some cases it may involve further observation (a doubtful schizophrenia) or a special investigation (electroencephalogram in cases of possible epilepsy).

The Treatment.

Apart from the attention to any disorder discovered in the history taking and the examination, the treatment will consist largely of discussion of relevant matters which have arisen in earlier stages and of any matters concerning the conduct of the marriage that the candidates may wish to talk about. During the more private examination it is well to offer each of them an opportunity of discussing privately anything that may be desired, and then to arrange the rest of the discussion with the two together if they are willing for it.

The range of possible material is too wide to cover in a brief article, but there are some frequently encountered and often misunderstood subjects that seem worthy of special consideration. They are well handled by what is known as the counselling approach, in which the two people are encouraged to express their ideas and feelings about the various matters and the doctor helps them to better clarification and better insight by listening, responding to their expressed feelings, and offering factual information rather than actual advice at appropriate points.

In some cases groups of young people have derived much deeper insight and maturity through group discussion with other young couples under competent leadership before marriage, but such "group dynamics" projects have so far been organized by other than medical bodies, though often with medical cooperation.

Among the matters that may come up in a pre-marital medical consultation are those concerning heredity,

potency and fertility, the advisability of going on with the marriage, family planning, and the sexual relationship in marriage. These will be considered in that order.

If there is concern about the possibility of transmission of a hereditary "taint", the doctor will need to give consideration to the data elicited in the history and examination, with specialist help in difficult cases. It is generally possible to give reassurance, perhaps accompanied by a reminder that there are no "perfect" family trees in any country. As far as possible he should give the known facts and their possible implications, and leave it to the people to decide.

In questions of doubtful potency or fertility the doctor can do no more than investigate all possible elements in the situation, and then state the facts as he sees them, perhaps again with a reminder that potency and fertility cannot be guaranteed in anyone.

When the doctor's opinion is sought in cases of serious doubts in the mind of either candidate or of parents about the advisability of going on with the marriage, he will need to feel his way very carefully and tactfully. Everyone concerned should be given a good hearing and the opportunity of full discussion, and then any necessary observations and investigations should be carried out. Then the relevant data may be communicated to the people concerned, and the decision is generally left to them. In some cases, however, a more "directive" approach may appear to be warranted. For example, if a plausible and persuasive but potentially criminal psychopath has managed to "hypnotize" a credulous inexperienced girl to "fall" heavily for him, to the alarm of her parents and friends, the doctor may be confronted with a very difficult situation which demands all the wisdom and tact at his disposal. In such a case it may be easier to persuade the people to postpone the marriage rather than to cancel it, even though invitations have gone out. This may give time for the romantic glamour in the girl's mind to be replaced by more realistic insight.

Another urgent pre-marital problem involving serious doubts about going on with the marriage is that of "pre-marital panic", in which, the wedding being arranged within a few days (or hours) and the presents all on display, the bride or bridegroom suddenly breaks down with the desperate cry, "I can't go through with it!", coupled often with an attack of acute hysteria. The doctor, urgently summoned, may have no longer than a few hours to grapple with this emergency and to assess the real situation. Is the person really in such condition that the wedding must be postponed, or is it a matter for good therapeutic "catharsis" and reassurance? A knowledge of the previous history of the person's emotional stability and of the general course of the courtship and engagement will be of considerable help. If he can achieve *rapport* with the disturbed person, the whole problem may become clarified quickly. In any case of real doubt the doctor may feel disposed to suggest to the people concerned that whatever the inconvenience and humiliation caused by a "last minute" postponement of the wedding, that is trivial when compared with the risks of embarking on the marriage in the emotionally charged circumstances. Everybody will be helped by the cool head and the quietly confident approach exhibited by the one person who may be in a position to assess the real factors in the emergency.

One of the most frequent requests made by young couples in the pre-marital medical consultation is for help in family planning, particularly to enable the girl to go on working for a year or two after marriage. Many admit frankly that this is what brought them to the doctor, and that they were not seeking any other help.

The principle of family planning is generally accepted, but some of the methods of accomplishing it are condemned by certain religious denominational authorities, even to the extent of forbidding medical members of those denominations to give their patients any information or help in contraceptive methods. Every doctor must needs work out his own attitude to this problem according to his own conscience, but it is an essential principle of medical ethics that no doctor should attempt to impose on any patient any attitude or conduct which may be in conflict with the patient's religious beliefs or affiliations. Fortunately there are reasonable methods of family planning which go a long way to meet the needs of young couples without contravening any religious enactments.

It would seem to be the proper function of the doctor whose help is sought in family planning firstly to find out from the people how they feel about it and about the various methods of accomplishing it, then to make what examination he thinks fit, and then to offer such information and help as seems appropriate within the limitations of the patient's attitudes and according to his own conscience. The various methods are well known by doctors, and no detailed discussion of them would appear necessary in this article. The whole subject is discussed fully in Dr. Edward F. Griffith's book, "Modern Marriage and Birth Control" (Dymock's, Sydney).

Lastly, in dealing with family planning the doctor may be asked for guidance about how soon a family should be commenced and how far apart children ought to be spaced. No rigid rules can be laid down, but in general the sooner a young couple can begin their family (after the girl has had a few months to settle down and as long as they have somewhere reasonably suitable to live) the better. Couples who delay the beginning of their families for too long are in danger of becoming so accustomed to their life together that children may be felt as inconvenient intruders.

The minimum spacing between children is mainly determined by such considerations as the health and stamina of the mother, the availability of help, and the general domestic facilities and finances. It may help parents to plan their families if they are given the biological information that the reproductive efficiency of women begins to decline at the age of 35 years, although of course many healthy children are born to mothers aged 40 or more.

There is some information about the sexual relationship in marriage that the doctor, more fittingly than anyone, may be able to give. Many young couples have read books about it, often with some profit, but in some cases they have come to think of sexual intercourse mainly from the viewpoint of technique, any "failure" in which is regarded as a serious reflexion on their "masculinity" or "femininity". This makes for many difficulties and disappointments, and they may be so self-conscious in the performance of the "ritual" that they miss much of the mutual joy in the whole relationship. Beyond the factual information about the anatomy and physiology of sexual intercourse and the details of the orgasm in men and women, obtainable from books or from discussion with the doctor, there are other important matters in which the doctor may give valuable help, a brief account of which may now be given.

It may be introduced by a reminder that love is a living quality, which, like other living things, needs constant adequate "nourishment" if it is to survive and grow. Love is nourished only by being given and received, and this can happen in three main ways. The first of these is by word of mouth, "I love you", accompanied by the appropriate gestures and regularly repeated with conviction. But if they are to go on carrying conviction such words need to be backed up by suitable deeds, by all kinds of thoughtful and generous actions offered spontaneously without strings as expressions of love. This second way of offering love is something about which many married people as well as those about to marry need some reminding, because these loving actions are often overlooked after marriage.

These two methods, good as they are, still fail to express the deepest reaches of love. The young people themselves will have observed to each other that their love is "too deep for words to express". They may well agree that it is also too deep for actions of this kind to express adequately, because such loving actions and words can be offered to many people. Something deeper is needed to express the deep mystery of human love, the deep and intimate union of two personalities, the progressive sharing and intertwining of their whole lives. This is where sexual intercourse can make a unique contribution to the marriage when it is conceived and approached in

a manner appropriate to its fullest significance. It takes the most intimate and exclusive contact between two people and uses it to express the complete abandoned self-offering in love of each to the other, and their "one-flesh-nss", which is the symbol of their marriage. At this sacramental level it is the expression of the closest personal relationship and a challenge to the quality of the mutual love of the partners as well as a continuing source of the deepest nourishment to it.

Many people do not think of sexual intercourse in this way, but rather as the gratification of an appetite, and there is room for whatever view people may take of it. But it would seem right that young people should have this aspect of it offered for their consideration so that they can give it some attention in the working out of their partnership. An understanding doctor may have a profound influence for good in the lives of many such young people in this way.

There is also an opportunity for the doctor to offer a brief account of differences in the general attitudes of men and women to sexual intercourse, so that husbands and wives may come to better understanding of each other. He can remind them that the sexual impulse in men is generally more direct and aggressive, while in women, at least at the beginning, it may need to be awakened and reinforced by appropriate wooing, in which the woman can feel a genuine self-offering as well as desire on her husband's part. An important example of this difference is seen when after a quarrel a husband may try to use sexual intercourse as a gesture of reconciliation. This to his wife may be an affront to her dignity, a gesture of condescension, and when she rejects this sincere approach her husband may think her stubbornly unforgiving. If he can accept her feelings in this and seek intercourse as an expression of a reconciliation that has already been achieved, the outcome will generally be much better. A woman's dignity is as precious to her as a man's honour is to him, and many marital disorders begin through a failure of the husband to cherish and uphold it.

It is clear that the pre-marital consultation can include a wide variety of elements, according to the needs of the people concerned and the attitudes and experience of the doctor. The doctor's time will obviously be an important element in the whole project, and this will be seen in relationship with the value he places on thoroughness in doing it. In many cases it may be difficult for him to secure an adequate financial remuneration for the time given, but good work in pre-marital counselling may well bring rich dividends in later doctor-patient relationships, especially for the general practitioner.

It is hoped that this account of the pre-marital medical consultation may stimulate other medical practitioners to contribute their ideas, so that a well-balanced medical policy and programme may become established in this important field of preventive medicine.

Summary.

There seems to be a need for more coherent medical policy in pre-marital consultations.

A workable medical approach is suggested.

Some particular matters for discussion are considered.

WILLIAM L. CARRINGTON, M.D.,
President, and Director of Counsellor Training, Marriage Guidance Council of Victoria.

Melbourne.

Appendix I.

The following questions might be put to the two candidates together, not necessarily by the doctor. The main object is that they should receive reasonable consideration before the wedding.

1. Home. Workable plans for suitable accommodation? Management? Wife going on working? How long? Husband's job secure? Organization of finances—joint account? Budgeting? Insurances?

2. Children. Agreed about having them? How many? Family planning? How? Do you need medical help with it? Agree on management of children? Strict or not strict?

3. In-laws and other relatives. Know them well? Get on well with them? What attitude have they taken toward the marriage?

4. Friends. Able to share individual friends? Other young couples? Associates in jobs, sports, other interests.

5. Interests in common and individual interests. Some of each? Which will be kept on? Agreed about these?

6. Religious affiliations. Compatible? If not, what kind of solution? What about children?

7. Other marked differences in education, politics, race, colour, age, social background, financial background. Working through them?

8. Sexual relationships. Sex education? Attitudes to sex compatible. Any doubts or worries about it, or conflicts?

9. Personal relationships. Many unresolved differences or conflicts? What about mainly? How generally dealt with? Old scores? United front to in-laws and others? Able to accept each other even where unable to understand?

10. Kind of home and upbringing of each. Parents happily married? Accessible to talk things over with? Which parent dominated?

11. Previous marriages or engagements. How terminated? By whom? Why?

Appendix II.

The following questions might be put to each candidate separately from the other. The main object is to give an opportunity to discuss doubts, apprehensions and difficulties not at present desired to be shared with the partner.

1. The marriage itself. How do you feel about it? Any doubts, worries or misgivings? Sure about your love? Enjoy being together without necessarily depending on physical stimulation? Do you still feel united when you are separated? Do you respond to each other spontaneously, and accept each other's occasional unresponsiveness.

2. Yourself. Anything about yourself that makes you wonder whether it will be all right to marry? Anything hidden from partner which could affect the marriage relationship if it came out later?

3. Your partner. Anything about your partner that worries you—even a little? Possessiveness? Jealousy? Untruthfulness? Evasiveness? Over-suspiciousness? Over-dependence on parents? Alcohol? Sex?

4. Families. How do you get on with your partner's family and friends? How does your partner get on with yours? Are you proud to show your partner to your family and your special friends? Can you cope with your own family if they try to dominate you?

A Suggested Bibliography.

Suitable for Reading by Engaged Couples as well as by Doctors.

"The Sexual Side of Marriage", by M. J. Exner, M.D. (Paperback.)

"The Art of Marriage", by Mary Macaulay, M.D., Delisle, 1952. (Also in paperback.)

"The Sex Factor in Marriage", by Helena Wright, Williams & Norgate.

"Starting Your Family", National Marriage Guidance Council, London, Pamphlet, 1960.

"Sex Attitudes in the Home", by Ralph G. Eckert, Popular Library, N.Y., 1958.

More Suitable for Medical Reading.

"A Marriage Manual", by Abraham Stone, M.D., and Hannah Stone, M.D., Gollancz, 1945.

"Modern Marriage and Birth Control", by E. F. Griffith, M.R.C.S., L.R.C.P., Dymock's, Sydney, 1946.

"The Premarital Consultation", by Abraham Stone, M.D., and Lena Levine, M.D., Grune & Stratton, New York and London, 1956.

"Marriage and Personality", by Ainslie Meares, M.B., B.S., B.Agr.Sc., D.P.M., Charles C. Thomas, Springfield, Illinois, 1958.

"Man and Wife", edited by Emily H. Mudd, Ph.D., and Aaron Krich, Ph.D., W. W. Norton & Co. Inc., New York, 1957.

"Physiology of Sex", by Kenneth M. Walker, F.R.C.S., Pelican Books, 1940.

"Premarital Counseling", by Granger Westberg, Department of Family Life, National Council of Churches of Christ in U.S.A., 1958.

"Marriage Preparation through Group Discussion", N.M.G.C. Pamphlet.

"Sexual Difficulties in Women with Special Reference to Frigidity", by Mary Macaulay, M.D., N.M.G.C. Pamphlet.

"The Art of Loving", by Erich Fromm, Harper & Bros., New York, 1956.

British Medical Association.

NEW SOUTH WALES BRANCH: SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on October 29, 1960, in the Florey Lecture Theatre, John Curtin School of Medical Research, Canberra, A.C.T., DR. B. A. COOK, the President, in the chair.

The Hazards of Modern Therapy.

DR. J. R. SANDS read a paper entitled "Some Hazards of Modern Therapy" (see page 648).

DR. M. DE L. FAUNCE said that he had recently been interested in a case of sulphonamide sensitivity. A boy in his twenties, under care in hospital, had for some years been considered to be suffering from dermatitis herpetiformis. He had consulted a number of dermatologists, who had confirmed the diagnosis; eosinophilia was present, and there was a pleomorphic vesicular rash. He was given sulphapyridine by way of treatment; that was the standard method recommended by Molesworth and other authorities. Dr. Faunce said that he himself thought it rather strange that that should be so. The complaint was one with a strong sensitivity background, and they were treating it with an agent known for its sensitizing effects and producing collagen diseases. The boy under discussion finally presented with polyarteritis nodosa. Dr. Faunce said that he considered that the patient had been tipped over by the use of sulphapyridine.

Dr. Sands, in reply, referred to a worrying experience at Royal Prince Alfred Hospital. A young man, a photographer, whose initial problem was impotence, treated himself with testosterone. After three months he found that he had atrophy of the testes, so he bought a syringe and some "Antuitrin S" and gave himself injections, after which he developed polyarthritis, for which he put himself on cortisone. He presented himself for treatment with polyarteritis, a raised blood urea level, pericarditis and a rash. The problem in treatment was whether to increase the dosage of steroids or to stop their administration. Over the next six months his symptoms subsided. He was examined again after three years, when he was in remission and very well. Six weeks prior to the meeting he had again begun treating himself with testosterone and "Antuitrin S", and now presented a classical nephrotic syndrome. Dr. Sands then described a second case, that of two women, a mother and a daughter, who were sitting on the floor cutting out the daughter's wedding dress when they both had a first attack of asthma. In both the asthma became worse and worse; they developed intense eosinophilia and were treated with steroids. The mother's condition deteriorated, and she finally died from polyarteritis nodosa. By that time the daughter had become pregnant; and she went into remission of the asthma. However, after delivery it recurred, and six months prior to the meeting she also died from polyarteritis nodosa. Dr. Sands said that the field was an obscure one; the sulphonamides seemed to have played a very great part.

DR. R. J. HOY asked Dr. Sands if he could say whether there was anything new relating to the way in which fatalities or near fatalities followed the injection of complex iodine-containing molecules, as in cholecystography and pyelography.

Dr. Sands said that he did not know. Iodine had been a favourite drug for workers in immunology. It had been believed to produce a whole series of diseases, from urticaria to serum sickness to polyarteritis nodosa.

DR. D. C. HENCHMAN asked Dr. Sands to say a little more about penicillin reactions. He wondered whether the immediate anaphylactic reaction was really due to the penicillin or to the procaine component. Some people considered that it was necessary to inject intravenously or partly intravenously in order to produce a shock reaction or death. Dr. Henchman also asked whether there had been any serious reactions to phenoxymethylpenicillin or to benzathine penicillin preparations given by mouth.

Dr. Sands, in reply, said that much of the information on the matter under discussion had been afforded by a survey carried out by the Australian College of General Practitioners. It seemed that penicillin itself had the capacity to produce anaphylactic reactions; it did not need to be injected intravenously or compounded with procaine. Dr. Sands did not know of any fatal reactions following the oral administration of penicillin in Australia.

DR. HELEN WILES said that she had recently read that penicillin caused convulsions in very high dosage. She thought that it might be possible to exceed safe doses in young subjects, and wondered whether that had been met clinically.

Dr. Sands said that he had seen that reported, and thought the danger one of the calculated risks. There were some conditions, such as endocarditis, in which it was necessary to use astronomical doses up to 100 million units daily.

Dr. Faunce spoke again. He referred to Dr. Henchman's question about penicillin, and said that one of the odd things that he was at present finding with phenoxymethylpenicillin was the extreme drowsiness that it occasionally produced. A dosage of 250 mg. three times a day could make a patient very somnolent. Recently there had been a number of letters to the journals recording similar experience with the drug.

Dr. Sands, in reply, said that he knew nothing of that effect; he had not seen it or read about it.

Operating Theatre Deaths and their Prevention.

DR. R. B. SPEIRS read a paper entitled "Operating Theatre Deaths and their Prevention" (see page 651).

DR. B. M. ANDREA said that he agreed with everything that Dr. Speirs had said. One aspect fascinated him. A degree of peripheral circulatory failure often occurred within a short time of the onset of cardiac arrest. That, combined with positive pressure ventilation of the lungs, would result in a poor venous return to the heart. One problem in those cases was to get the blood to return to the heart. The Trendelenburg position was some help. Dr. Andrea said that he had been startled to hear Dr. Safar say, when he was in Australia, that it was possible to massage the heart through the intact chest wall; he could not see how it was possible to do so. He therefore wished to ask two questions: (i) How could the blood be made to return to the heart? (ii) How could one massage a flaccid heart unless it was actually held in the hand?

Dr. Speirs, in reply, said that his experience of the external method of compression was entirely by word of mouth; he had had no practical experience of it. To quote someone who had had two or three cases of cardiac arrest, he had found that the Trendelenburg position did ensure a more adequate return of the blood to the heart than any other measure. That was the reason why the Trendelenburg position had been recommended in total spinal anæsthesia. The opinion of the authority whom he was quoting was also that external compression worked well. It was necessary to pick the largest, heaviest and most muscular person in the operating theatre to do the job, and instruct him to try to break the patient's ribs. If that was done, a systolic blood pressure of 80 mm. of mercury might be recorded. If it could not, then the procedure should be abandoned and the surgeon should open the patient's chest.

DR. E. S. STUCKEY said that there was no part of Dr. Speirs' paper that he would question; he agreed with everything that had been said. He wished to reiterate one point—that, except when the patient was known to be a gross risk, an operating theatre death was due to human error; if there had been no error made by the surgeon, then the death was due to an error made by the anæsthetist. In looking back over the case, that fact must not be evaded. Referring to differences in the size of patients, Dr. Stuckey said that if one had to deal with cardiac arrest in an infant, it could be done with two fingers, the heart being compressed against the sternum.

DR. W. L. CALOV said that he had not had much experience in the operating theatre for many years. After hearing the terrifying things told by Dr. Speirs, he was rather glad that his only dealings now were with the more slowly lethal drugs discussed by Dr. Sands. Dr. Calov then lightheartedly related a number of experiences to illustrate various points in Dr. Speirs' paper.

Dr. Cook, from the chair, said that the two papers, on two types of hazards, had been most stimulating. The first, by Dr. Sands, on hazards of modern therapy, had said much that had to be said, especially for the younger practitioners, who were susceptible to the detail man and every drug put on their desks. Dr. Speirs' paper on hazards of the operating theatre should receive the widest publicity. It was a careful survey of the human element factor in theatre deaths, and it was also something that had to be said.

NEW SOUTH WALES BRANCH: NOTICE.

Translation into Four Languages of Three Questions Relating to Tetanus Immunization.

As the result of correspondence between the New South Wales Branch of the British Medical Association and the Migrant Information Service of the Commonwealth Bank of Australia, we have been asked by the Assistant Medical Secretary of the Branch to publish the following translations into Finnish, German, Greek and Italian of three questions relating to tetanus immunization. The translations have been supplied by the Migrant Information Service of the Bank.

Question 1: "Have you been immunized for tetanus?"

German "Sind Sie gegen Tetanus geimpft?"

Finnish: "Onko Teitä rokotettu jäykkäkouristus tautia vastaan?"

Italian: "Siete stato immunizzato contro il tetano?"

Greek: "Ἔχεις ἐμβολιασθῆ ἐναντίον τῆς μολύνσεως τοῦ Τετάνου;

Question 2: "Have you had a series of tetanus injections over a period?"

German: "Haben Sie eine Serie von Tetanus Impfungen für eine gewisse Periode bekommen?"

Finnish: "Onko tämä rokotus sarja annettu jatkuvasti määrätyin valiajoin?"

Italian: "Avete avuto una serie di iniezioni contro il tetano in un dato periodo di tempo?"

Greek: "Ἔχεις ἐμβολιασθῆ διά σειράν ἐνέσεων ἐναντίον τῆς μολύνσεως;

Question 3: "How long ago?"

German: "Wie lange (liegt dies) zurück?"

Finnish: "Kuinka kauan sitten?"

Italian: "Quanto tempo fa?"

Greek: τοῦ Τετάνου; Πότε;

THE DORIS ODLUM PRIZE.

THE Doris Odlum Prize for studies in the field of mental health will be awarded in 1962 for a study of "Progress in the Community Care of Mental Disorder" (a critical and constructive review of advances made in this field in the five years ending on September 30, 1961). This prize is £80 in value. Any medical practitioner registered in the British Commonwealth or in the Republic of Ireland may compete. The closing date for entries is December 31, 1961. Preliminary notice of entry is required, and forms and further particulars may be obtained from The Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, England.

QUEENSLAND BRANCH.

Dinner to Welcome Officers of the Parent Body and to Honour Three Members of the Branch.

THE following is published at the request of the Queensland Branch of the British Medical Association.

A very enjoyable Branch dinner, attended by some 60 members and guests, was held at Lennon's Hotel, Brisbane, on February 20, 1961. The function had two purposes: (i) to welcome officers from the Parent Body who were visiting Queensland (Dr. Talbot Rogers, Chairman of the Representative Body, Professor D. E. C. Mekie, Chairman of the Overseas Committee, and Mr. W. S. Giles, Financial Comptroller of the British Medical Association); (ii) to honour three senior members, Dr. H. W. Horn, Dr. A. E. Lee and Dr. J. G. Wagner, whose distinguished services to the Branch and to the medical profession had recently been recognized by their election to the Roll of Fellows of the B.M.A., and to whom commemorative scrolls were presented by Dr. Talbot Rogers.

In reply to the welcome extended by the Branch President, Dr. P. A. Earnshaw, Dr. Talbot Rogers conveyed cordial greetings to the Queensland Branch from the Parent Body and, in a reference to the impending formation of the Australian Medical Association, expressed the sincere hope of the British Medical Association that the strong and friendly ties with the profession in Australia would always be maintained.

Dr. Robert Miller, on behalf of the Branch Council, then introduced the three new Fellows. He said that it was at the suggestion of the Parent Body of the B.M.A. that the gathering to honour their three Queensland colleagues had met. When they were advised that the names of those medical practitioners had been approved for admission to the Roll of Fellows, the General Secretary mentioned that the scrolls awarded to the Fellows were usually presented at the Annual Representative Meeting of the B.M.A., but that as senior officers of the Association would be in Brisbane in February, 1961, it would perhaps be appropriate to present the scrolls at a function in Brisbane. The present function was peculiar, in that it was one of the few occasions on which they had met socially as a profession, to pay honour and just tribute to their colleagues during their lifetime. Doctors were mean with their praise and thanks for services rendered to the profession, and he felt that the Parent Body had that in view when it instituted the Roll of Fellows of the British Medical Association.

The object of the Roll was: "To grant a distinctive status, recorded and recognised by the Association, for outstanding services given by members of the Association (whether in active practice or retired) to their Divisions or Branches—such services to comprise purely local service or local service combined with service given to the Association as a whole." There were five criteria to be fulfilled for admission to the Roll of Fellows: (i) ten years' uninterrupted membership of the Association; (ii) a minimum of seven years in office as a Branch Councillor; (iii) distinguished service as a member of a quasi-independent medical body; (iv) outstanding achievement as a leader of the profession locally; (v) service to the Association as a whole. The records of the three who were being honoured showed how outstanding their services had been, and how amply each of them had fulfilled the required criteria.

Harold William Horn, after service in the Infantry and Intelligence in the A.I.F. during the First World War, graduated M.B., Ch.M. from the University of Sydney in 1923 and went into general practice. He subsequently specialized in obstetrics and gynæcology. During his 36 years' membership of the Association he was a Branch Councillor for 19 years, including four years as Chairman of Council and five years as Honorary Treasurer. As Branch Representative, he attended the Annual Representative Meeting held in Brighton in 1956. He was President of the Branch in 1945, and was elected Vice-President in 1959—only the third member to be so elected since the Branch was formed. He was, or had been, a director of the British Medical Agency of Queensland, the Queensland Medical Finance Company and the Queensland Medical Land Investment Company; a Councillor of the Medical Defence Society of Queensland, and the State Executive Committee of the Medical Benefits Fund; a member of the Committee of Inquiry for the Pensioner Medical Service, the Medical Planning Committee, the Lodge Committee, the Faculty of Medicine and the Medical Board of Queensland. He served on Federal Council for 11 years (1946 to 1956), represented the Federal Council at the meeting of the World Medical Association in Rome in 1954, and had been a member of the Australasian Medical Publishing Company since 1948. He took an active part in Federal Council negotiations at the inception of the National Health Service and, at the time when a scheme unfavourable to the profession was being encouraged by the Commonwealth Government, he toured Queensland to explain Council's proposals to members. He was prominent in negotiations with the State Government, especially in relation to workers' compensation.

Alan Edward Lee graduated at the University of Melbourne in 1920, and proceeded to his M.D. degree in 1922 and to the diplomas of F.R.C.S. (Eng.) in 1924 and F.R.A.C.S. in 1928. He was a surgeon. A member of the Association for 35 years, he was a Branch Councillor for 21 years, including two years as President and two years as Chairman of Council. He was, or had been, a director of the British Medical Agency of Queensland, the Queensland Medical Finance Company and the Queensland Medical Land Investment Company; Chairman of the State Committee of the Medical Benefits Fund, the Queensland State Committee of the Royal Australasian College of Surgeons, and the Visiting Staff Association of the Brisbane General Hospital; Vice-Chairman of the Post-Graduate Medical Education Committee; a member of the Queensland Radium Institute, the

Faculty of Medicine, the Medical Planning Committee and the Medical and Allied Professions Superannuation Fund. He was Consulting Surgeon to the Brisbane General Hospital and Greenslopes Repatriation Hospital. A member of Federal Council for 18 years (1942 to 1959), he was the Council's representative at the British Commonwealth Medical Conferences in Australia in 1950 and in India in 1952. He was a member of the Commonwealth Health Insurance Council, and had been a director of the Australasian Medical Publishing Company since 1944. He was an Australian delegate to the World Medical Association meeting in Berlin in 1960, and was also a member of the Blue Cross Association of Australia. He helped, as a Federal Councillor, to evolve a policy and plan for a National Health Service which the Commonwealth Government adopted. He helped to organize voluntary health insurance schemes, and had played a prominent Australia-wide part in furthering those schemes. He was also active in promoting a change from the honorary service to a part-time paid status for public hospital visiting staff.

John George Wagner obtained his B.Sc. degree at the University of Queensland in 1917, and served as a munitions chemist at Queensferry and Avonmouth during the First World War. In 1924 he graduated as M.B., Ch.M. from the University of Sydney, and had been in general practice ever since. For 36 years he had been a member of the Association, during which period he served on Branch Council for 22 years, including two years as President and eight years as Honorary Treasurer. He was elected Vice-President in 1958. He was, or had been, a member of the Medical Board of Queensland since 1940; a director of the British Medical Agency of Queensland, the Queensland Medical Finance Company and the Queensland Medical Land Investment Company; a councillor of the Medical Defence Society of Queensland; a trustee of the Medical and Allied Professions Superannuation Fund, the Queensland Medical War Benefit Fund and the Federal Medical War Relief Fund; a member of the State Executive Committee of the Medical Benefits Fund; the Rehabilitation of Medical Officers of the Armed Services Committee, the Medical Planning Committee and the Joint Lodge Committee; Deputy Chairman and Executive Officer of the Queensland Medical Coordination Committee (1941 to 1946); Vice-President of the Old People's Welfare League. He had served on the Federal Council for two years (1956 and 1957), and had been a member of the Australasian Medical Publishing Company since 1956. In addition to taking an active part in all Branch activities, Dr. Wagner gave particularly important service during the war years as Deputy Chairman and Executive Officer of the Queensland Medical Coordination Committee, which controlled the activities of all practitioners in civilian and civil hospital practice. A measure of the impartiality and success with which he carried out those duties was shown by the fact that his colleagues reelected him as Branch President on completion of that exacting office.

Dr. Miller, in conclusion, said that up to that point his remarks had been factual. Some comments must be made on the personal qualities of the three who were being honoured. He could present them only in the light in which he saw them and in the way he knew them. Each was an individualist; each was able to express his convictions with fervour, and to approach any question of import with determination. Each had given untiringly and unselfishly of his time to the Association. Each had worked in a complementary way with the others. Each had been an architect and a builder of their way of practice for many years, and the future development of the lives of medical practitioners would depend on the way in which they themselves built upwards and outwards on the foundations Dr. Horn, Dr. Lee and Dr. Wagner had laid.

Dr. Miller then presented to Dr. Talbot Rogers, Chairman of the Representative Body, Dr. Harold Horn, Dr. Alan Lee and Dr. John Wagner for admission as Fellows of the British Medical Association.

In presenting the scrolls, Dr. Talbot Rogers said that the occasion was particularly unique, in that it was the first time such honours had been awarded to members overseas, and, in view of the impending formation of the Australian Medical Association, such an occasion might conceivably never occur again in Australia.

Dr. Harold Horn suitably responded on behalf of Dr. Lee, Dr. Wagner and himself, expressing their sincere thanks for the great honour which had been shown them and for the kind remarks that had been made by Dr. Miller.

Out of the Past.

RECEPTION HOUSES FOR THE INSANE.[1]

[From the *Australasian Medical Gazette*, November 20, 1902.]

IN New South Wales at present one reception house is established at Darlinghurst, Sydney, but steps are now being taken to open a second one at Newcastle. The institution at Darlinghurst has been found of the greatest value in dealing with persons whose insanity is in doubt; it has also intercepted a large number of cases of acute alcoholic insanity. It has hitherto been the custom, in the absence of a reception house, to make use of the local gaol. The objection to the arrangement is the sentimental one of committing an insane person to prison, and this has often a retarding influence on the recovery of the patient by giving the impression that the detention in gaol is because of some offence and not for illness, and thereby, perhaps, fixing a delusion. To avoid the commitment to gaol, the alternative of utilising the local hospital suggests itself. During the year correspondence on these lines was entered into with one of the local hospital committees. It is to be regretted that the hospital committee wrote absolutely declining to undertake the responsibility. It cannot but be felt that in taking up this position, which strongly accentuates a distinction between those affected with mental disorders and cases of ordinary sickness, the community is losing sight of the humanitarian view that the insane, because of their affliction with this distressing disease, should be treated as cases of ordinary illness, and not as prisoners or outcasts.

Correspondence.

PULMONARY EMBOLISM.

SIR: In a recent Current Comment (MED. J. AUST., April 15, 1961) you commented on a study on pulmonary embolism carried out in Britain and emphasized the need for further investigations of this problem. An experimental cardiorespiratory study on pulmonary embolism has been performed in this Department. As you may be aware, the first part of this research was presented to a meeting of The Royal Australasian College of Physicians last October in Sydney.

Yours, etc.,

D. F. J. HALMAGYI,
H. J. H. COLEBATCH,
Department of Medicine,
The University of Sydney.

April 21, 1961.

PULMONARY HYDATID DISEASE.

SIR: The article "Pulmonary Hydatid Disease" (MED. J. AUST., March 11, 1961) and the correspondence arising from it cause the following reflections. Diagnosis is difficult in the absence of serious complications or catastrophes, and laboratory tests quite uncertain. Hence the incidence in the community must be very difficult to determine, and probably can only be determined by large series of unselected post-mortem examinations. Unfortunately these are seldom performed in any numbers in rural areas.

With regard to attempts to control this disease, it is not generally realized that the persons most concerned, the small farmer-graziers, are not just apathetic, but are often actively antagonistic. The apathy is largely due to lack of knowledge but also partly to the inherently conservative attitude of these people. The antagonism is due to the little advice they have received, namely, "Don't feed your dogs with infested offal". Feeding dogs is expensive and requires lots of meat. Sheep are killed for this purpose but obviously they choose sheep of poor value, sick and even dead sheep. Infested offal from household killers naturally goes to the dogs, and to talk of boiling it is just unrealistic.

The only method of breaking the cycle is to worm the dogs, and do it regularly. This could only be achieved after

[1] From the original in the Mitchell Library, Sydney.

extensive public education, and would need to be followed later by penalties for infested dogs.

It is interesting to observe the rather contemptuous attitude of rural people to hydatid disease. I can only assume it is due to their close association with a moderately widely spread infestation of sheep and, in prior years, rabbits. The animals do not seem much affected, in fact, it is usually unsuspected. The same fact gives me cause to wonder about the human population.

Yours, etc.,

W. R. ATKINSON.

Hebden Street,
Lockhart,
New South Wales.
April 20, 1961.

WORKERS' COMPENSATION ACT.

SIR: I refer to the monthly bulletin of the New South Wales Branch of the B.M.A., dated March 6, 1961, page 4, under the heading "Workers' Compensation Act, 1926-1960", reading from the tenth line, and I quote:

> However when a service is rendered to an injured worker at the express wish of the insurer or the employer then the insurer or the employer is liable for the cost of that service.

I suggest that the above paragraph is open to the false deduction that the injured worker may be obliged to submit to a service offered by the insurer or employer, and that a correction should be published pointing out that he is under no such obligation; also that the paragraph under discussion should not be repeated in its present form but only so as to include in it the qualification which I have emphasized. I submit that this is no quibble but a vitally important safeguard of the doctor-patient relationship and of private practice.

Yours, etc.,

C. C. MCKELLAR.

143 Macquarie Street,
Sydney.
April 24, 1961.

FURALTADONE—A CLINICAL TRIAL.

SIR: We thank Dr. R. Godfrey for his letter in the Journal of April 8, 1961, in which he draws attention to the toxic effects of furaltadone. These toxic effects have concerned us also, although we did not experience them in our trial, reported in this Journal of March 4, 1961, probably because our patients did not have long courses of treatment (average six days). Some authors have warned against long courses of furaltadone for this reason, although the frequency of these neurotoxic effects is difficult to assess. Numerous affected patients have been reported, but many patients (500,000 according to the manufacturers of the drug, quoted in an editorial in *The New England Journal of Medicine*[1]) have received courses of furaltadone.

The crux of the problem, however, is the effectiveness of the drug. Our article refers to several authors (Christenson and Tracy,[2] Glas and Britt,[3] Kefauver *et alii*,[4] Shrire and Engelbrecht[5]), who report good results with the drug, and our results in 48 cases were good. On the other hand, McCabe *et alii*[6] report unfavourable results. Of all these investigations we consider that of McCabe *et alii* to be outstanding, and the thoroughness of this work has greatly impressed us. This paper was available to us just before our results were printed, and we wrote an addendum briefly reporting their results and conclusions, including their findings that furaltadone therapy did not, in many cases, produce inhibitory concentrations in the blood, and that 20 of 28 cases of severe staphylococcal infection treated were assessed as failures. Their work also throws doubt on the validity of the disc method of testing sensitivity of pathogenic bacteria to furaltadone. McCabe *et alii* conclude that their "results permit no confidence in furaltadone as treatment for serious staphylococcal infections in the majority of patients".

We reported that in our trial we had not used furaltadone in cases of acute fulminating staphylococcal septicæmia because we felt the drug (given orally) would not produce therapeutic blood levels quickly enough. The results of McCabe *et alii* (particularly relating to blood levels and the disc method of sensitivity testing) throw doubt on the reliability of furaltadone as an antistaphylococcal drug and further assessment seems necessary. Until this is done, as Dr. Godfrey says, there are other efficient drugs available for the control of staphylococcal infections.

Lastly, we would like to repeat that, in the addendum to our paper, a printer's error occurred causing the "results of McCabe *et alii*" to be printed as the "results" of McCabe *et alii*". This unfortunate error was the subject of a corrigendum in a later issue.

Yours, etc.,

RODERICK MCEWIN,
JOHN MARSH.

Repatriation General Hospital,
Springbank,
South Australia.
April 24, 1961.

[1] *New Engl. J. Med.*, 1960, 263: 975.

[2] *Curr. ther. Res.*, 1960, 2: 22.

[3] Presented at a symposium on antibacterial therapy, September 12, 1959, under the auspices of the American Academy of General Practice (Detroit); to be published.

[4] *Antibiot. Ann.*, 1958-1959: 81.

[5] *S. Afr. med. J.*, 1960, 34: 537.

[6] *New Engl. J. Med.*, 1960, 263: 927.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Course in Occupational Health.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that, in conjunction with the School of Public Health and Tropical Medicine, a full-time course in occupational health will be held at the School from July 24 to August 11, 1961, under the supervision of Dr. Gordon C. Smith. It will comprise a series of lectures and visits to factories and other industrial undertakings.

The main subjects included in the course will be: definition and scope of occupational health; historical aspects; activities in other countries, and of international organizations; developments in Australia; organization, functions and responsibilities of occupational health services; duties and responsibilities of industrial medical officers; the working environment — chemical and physical aspects; recognition of occupational factors in disease and disability; psychological problems in industry; diseases and other effects caused by dusts, metals, solvents, pesticides and other chemicals; occupational diseases of the skin; industrial ophthalmology; noise and occupational hearing loss; ionizing radiations; occupational and public health aspects; prevention of occupational disease; accident causation and prevention; rehabilitation and employment of disabled persons; occupational health legislation; introduction to laboratory equipment and procedures.

Visits will be made to representative industries in order to study working conditions and processes related to the subjects of the course. The visits will occupy approximately twelve half-day periods. Any medical practitioner interested in occupational health may apply to attend either the complete course or the lectures only. No fees will be charged. However, written application is necessary, and should be sent to the Director, School of Public Health and Tropical Medicine, University of Sydney. The number of applicants for full-time attendance is limited to 12, and the closing date for receipt of applications is June 30, 1961. Applications to attend lectures only may be received later than that date. Further particulars may be obtained from the Course Supervisor, Dr. Gordon C. Smith, at the School.

Post-Graduate Conference at Tamworth.

The Post-Graduate Committee in Medicine in the University of Sydney announces that in conjunction with the Northern District Medical Association a week-end conference will be held at the Tamworth Base Hospital, Tamworth, on Saturday and Sunday, June 3 and 4, 1961. The programme is as follows.

Saturday, June 3: 2 p.m., "Peptic Ulceration", Dr. Douglas C. Mackenzie; 3 p.m., "Recent Advances in Medicine", Dr. T. I. Robertson; 4.30 p.m., "Renal Tract Infections", Dr. B. S. Pearson.

Sunday, June 45: 9.30 a.m., "Recent Advances in Surgery", Dr. Douglas C. Mackenzie; 11 a.m., seminar, "Benign Conditions of the Large Bowel", Honorary Staff, Tamworth Base Hospital; 2 p.m., "Hypertension", Dr. T. I. Robertson; 3 p.m., "Recent Advances in Urology".

The fee for attendance is £3 3s., and those wishing to attend are asked to notify Dr. D. Berg, Honorary Secretary, Northern District Medical Association, 430 Peel Street, Tamworth, as soon as possible. Telephone: Tamworth 4409.

ROYAL PRINCE ALFRED HOSPITAL: EAR, NOSE AND THROAT DEPARTMENT.

Seminar Programme, 1961.

THE staff of the ear, nose and throat department of the Royal Prince Alfred Hospital, Sydney, will conduct a seminar on the second Saturday of every month at 8 a.m. in the Scot Skirving Lecture Theatre. The main speaker will not exceed forty minutes, and there will be a discussion at the conclusion of his remarks. All medical practitioners and clinical students are invited to attend.

At the next seminar, to be held on May 13, Dr. V. G. Bulteau will speak on "Costen's Syndrome", and the discussion will be opened by Dr. P. B. Green and Dr. S. M. Morson.

Naval, Military and Air Force.

APPOINTMENTS.

THE following appointments, changes, etc., are published in the *Commonwealth of Australia Gazette*, No. 25, of March 16, 1961.

AUSTRALIAN MILITARY FORCES.

Australian Regular Army.

Royal Australian Army Medical Corps (Medical).

The following officers are appointed from Regular Army Special Reserve, Royal Australian Army Medical Corps (Medical) with a Short Service Commission of four years on the dates shown:—Captains 240231 J. V. Wells and 240232 A. K. Chalker, 4th January, 1961, 240233 A. G. Saareste and 240234 M. A. Naughton, 11th January, 1961.

4/7545 Colonel C. M. Gurner, E.D., is appointed from the Citizen Military Forces, Royal Australian Army Medical Corps (Medical), Central Command, and to be Lieutenant-Colonel (Temporary Colonel) with a Long Service Commission, and is appointed Deputy Director-General of Medical Services, 12th December, 1960.

1/8100 Captain R. N. Hurley is appointed from the Regular Army Special Reserve, Royal Australian Army Medical Corps (Medical), and to be Captain, 4th January, 1961, with a Short Service Commission for a period of four years.

To be Temporary Major, 18th January, 1961.—4/8055 Captain I. C. Miller.

Regular Army Special Reserve.

Royal Australian Army Medical Corps (Medical).

The following officers are appointed to the Australian Regular Army, Royal Australian Army Medical Corps (Medical) on the dates shown:—

Captains NX700482, J. V. Wells and NX700486 A. K. Chalker, 4th January, 1961, NX700485 A. G. Saareste and NX700487 M. A. Naughton, 11th January, 1961.

The appointment of VX700401 Lieutenant G. L. Richardson is terminated, 25th January, 1961.

To be Captains.—Lieutenants WX700178 A. J. Groessler, 20th November, 1960, and NX700492 W. J. Ruscoe, 9th January, 1961.

To be Captain, 3rd January, 1961.—QX700219 Lieutenant N. M. T. Reid.

QX700208 Captain R. N. Hurley is transferred to the Australian Regular Army, Royal Australian Army Medical Corps (Medical), 4th January, 1961.

Citizen Military Forces.

Northern Command.

Royal Australian Army Medical Corps (Medical).—4/31906 Major (Temporary Lieutenant-Colonel) M. W. Elliott relinquishes command 11th Field Ambulance, 30th June, 1960 and is appointed to command 1st Casualty Clearing Station, 1st July, 1960. 1/62943 Honorary Captain A. R. Trist is appointed from the Reserve of Officers and to be Captain (provisionally), 16th December, 1960.

Royal Australian Army Medical Corps (Medical).—2/144660 Honorary Captain R. G. R. Sim is appointed from the Reserve of Officers and to be Captain (provisionally), 31st October, 1960. *To be Majors, 7th December, 1960*—Captains 1/33165 D. Robertson, 1/62657 R. A. Rimington, 1/61769 L. J. Lowth and 1/32977 I. D. Forbes. *To be Captain (provisionally), 6th December, 1960*—139325 Peter John Cairns.

Eastern Command.

Royal Australian Army Medical Corps (Medical).—The provisional rank of 2189278 Captain P. E. Baume is confirmed. 2130127 Captain (provisionally) R. S. Gye relinquishes the provisional rank of Captain, 26th November, 1960, and is appointed to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), and is granted the honorary rank of Captain, 27th November, 1960. *To be Major, 3rd February, 1961*—2206961 Captain R. S. Hyslop. *To be Major, with pay and allowances of Captain, 3rd February, 1961*—2139768 Captain J. H. Hooper.

Royal Australian Army Medical Corps (Medical).—2/146527 Lieutenant-Colonel J. F. C. C. Cobley and 2/146609 Captain A. E. Cronin are transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), 21st November, 1960, and 30th November, 1960, respectively. Captains (provisionally) 2/127081 G. J. Flynn and 2/270322 R. D. Fewtrell relinquish the provisional rank of Captain, 26th August, 1960, and 10th November, 1960, respectively, and are transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command) and are granted the honorary rank of Captain, 27th August, 1960, and 11th November, 1960, respectively. The provisional appointments of the following officers are terminated.—Captains 2/146625 F. C. Hinde, 21st June, 1960, and 2/130126 D. S. Child, 21st December, 1960. *To be Captain (provisionally)*—2/146625 Frederick Charles Hinde, 22nd June, 1960, and 2/130126 Donald Stewart Child, 22nd December, 1960.

Royal Australian Army Medical Corps (Medical).—The regimental number of 2/126996 Colonel T. J. Ritchie, E.D., is as now described and not as shown in Commonwealth Gazette, No. 1, dated 5th January, 1960.

Southern Command.

Royal Australian Army Medical Corps (Medical).—The following officers are seconded whilst in the United Kingdom on the dates shown:—Captains (provisionally) 3/101044 K. F. King, 12th August, 1960, 3/101047 D. J. Burne, 3rd September, 1960, and 3/101046 E. J. Keogh, 3rd September, 1960. 3/129435 Captain (provisionally) K. E. Stuchbery relinquishes the provisional rank of Captain, 30th November, 1960, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command) and is granted the honorary rank of Captain, 1st December, 1960. The provisional appointments of the following officers are terminated on the dates shown:—Captains 3/129435 K. E. Stuchbery, 18th December, 1959, 3/101044 K. F. King, 11th August, 1960, 3/101047 D. J. Burne, 2nd September, 1960, 3/101046 E. J. Keogh, 2nd September, 1960, and 3/147604 B. A. Minto, 9th October, 1960. *To be Captains (provisionally)*—3/129435 Kenneth Edmund Stuchbery, 19th December, 1959, 3/101044 Kevin Francis King, 12th August, 1960, 3/101047 David John Burne, 3rd September, 1960, 3/101046 Eustace Julian Keogh, 3rd September, 1960, 3/147604 Brian Ainslie Minto, 10th October, 1960, and 3/129607 Richard Roger Darnton Watson, 6th January, 1961. *To be Major, 4th January, 1961*—3/129385 Captain M. G. Whiteside.

Royal Australian Army Medical Corps (Medical).—4/35548 Captain F. R. Betheras is seconded whilst in the United Kingdom, 1st October, 1960. 3/50197 Captain (provisionally) W. A. Syme relinquishes the provisional rank of Captain, 10th November, 1960, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command) and is granted the honorary rank of Captain, 11th November, 1960. The provisional appointment of 3/87648 Captain I. C. Goy is terminated, 22nd

September, 1960. *To be Captain (provisionally), 23rd September, 1960*—3/87648 Ian Christopher Goy.

Central Command.

Royal Australian Army Medical Corps (Medical).— 4/31903 Colonel C. M. Gurner, E.D., relinquishes command, 3rd General Hospital, 11th December, 1960, and is appointed to the Australian Regular Army, Royal Australian Army Medical Corps (Medical), 12th December, 1960. 4/31904 Lieutenant-Colonel P. S. Eyles ceases to be seconded whilst in United Kingdom, 21st September, 1960, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Central Command), 22nd September, 1960. *To be Major, 12th January, 1961*—4/32112 Captain (Temporary Major) R. Hecker. *To be Major (with pay and allowances of Captain), 21st December, 1960*—4/32104 Captain W. G. Tucker. *To be Temporary Major, 10th January, 1961*—4/32018 Captain B. L. Cornish.

Royal Australian Army Medical Corps (Medical).—4/32054 Captain L. C. Hoff ceases to be seconded whilst in the United Kingdom, 18th December, 1960, and to be Temporary Major, 19th December, 1960. *To be Major, 13th December, 1960*—4/32036 Captain (Temporary Major) T. H. Beare.

Western Command.

Royal Australian Army Medical Corps (Medical).—The notifications respecting 545068 Captain (provisionally) T. T. Nicholls which appeared in Executive Minute No. 63 of 1960, promulgated in Commonwealth Gazette No. 56 of 1960, are withdrawn. 545068 Captain (provisionally) T. T. Nicholls relinquishes the provisional rank of Captain, 23rd October, 1959, and is appointed to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Western Command) and is granted the honorary rank of Captain, 24th October, 1959.

Royal Australian Army Medical Corps (Medical).—4/31988 Major R. A. Barter is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Western Command), 4th October, 1960. 5/38112 Captain (provisionally) L. S. J. Miocevich relinquishes the provisional rank of Captain, 14th October, 1960, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Western Command) and is granted the honorary rank of Captain, 15th October, 1960. *To be Captain (provisionally), 21st December, 1960*—5/26669 Terence Michael McAuliffe.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps (Medical).

Northern Command.—The following officer is placed upon the Retired List (Northern Command) and is granted a military title equivalent to the substantive or honorary rank shown with permission to wear the perscribed uniform, 28th February, 1961:—Captain R. S. Cohen.

Eastern Command.—Honorary Captain A. W. Ross is retired, 31st December, 1960.

Southern Command.—Honorary Captain F. D. Burke is retired, 31st December, 1960.

Eastern Command.—The following officers are placed upon the Retired List (Eastern Command) and are granted the military title equivalent to the substantive or honorary rank shown, with permission to wear the prescribed uniform, 31st December, 1960:—Lieutenant-Colonel E. H. Goulston, Major R. E. Maffey and Captain D. J. Passmore.

Southern Command.—The following officers are placed upon the Retired List (Southern Command) and are granted the military title equivalent to the substantive or honorary rank shown, with permission to wear the prescribed uniform, 31st December, 1960:—Captains W. J. Hendry and H. Roland.

The following appointments, changes, etc., are published in the *Commonwealth of Australia Gazette*, No. 27, of March 23, 1961.

AUSTRALIAN MILITARY FORCES.

Australian Regular Army.

Royal Australian Army Medical Corps (Medical).

The Short Service Commission granted to 64010 Captain C. Young is extended until 7th May, 1961.

The resignations of Captains 18091 D. T. O'Connor and 18084 G. Middleton of their commissions are accepted, 17th January, 1961, and 10th February, 1961, respectively.

Regular Army Special Reserve.

Royal Australian Army Medical Corps (Medical).

To be Captains, 30th January, 1961.—Lieutenants SX700112 V. Matousek and SX700113 Z. Staska.

Citizen Military Forces.

Eastern Command.

Royal Australian Army Medical Corps (Medical).—2147950 Lieutenant-Colonel C. E. M. Gunther is placed upon the Retired List (Eastern Command) and is granted the military title of Lieutenant-Colonel, with permission to wear the prescribed uniform, 4th February, 1961.

Western Command.

Royal Australian Army Medical Corps (Medical).—521578 Lieutenant-Colonel C. Stuart, M.C., is appointed Deputy Director of Medical Services, Head-quarters Western Command, and to be Colonel, 16th August, 1961. 521578 Lieutenant-Colonel C. Stuart, M.C., relinquishes command 7th Field Ambulance, 6th February, 1961. 526391 Colonel R. R. Anderson, M.C., E.D., relinquishes the appointment of Deputy Director of Medical Services, Head-quarters Western Command, 15th August, 1961, and is transferred to Unattached List (Royal Australian Army Medical Corps) (Medical), Western Command, 16th August, 1961. 515975 Major D. C. Foster is appointed to command 7th Field Ambulance and to be Temporary Lieutenant-Colonel 7th February, 1961.

Unattached List.

Royal Australian Army Medical Corps (Medical).—526391 Colonel R. R. Anderson, M.C., E.D., is transferred from Royal Australian Army Medical Corps (Medical), Western Command, 16th August, 1961, with Army seniority (1st August, 1954).

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps (Medical).

Southern Command.—Honorary Captains J. F. Adamson and E. H. Barrett are retired, 28th February, 1961.

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force.

Medical Branch.

Karlis Audrins (0220936) is appointed to a temporary commission, 21st July, 1960, with the rank of Pilot Officer (Student).

Air Force Reserve.

Medical Branch.

The appointment of Flight Lieutenant B. M. Dwyer (0210594) is terminated, 20th December, 1960.

The following appointments, changes, etc., are published in the *Commonwealth of Australia Gazette*, No. 32, of April 13, 1961.

AUSTRALIAN MILITARY FORCES.

Australian Regular Army.

Royal Australian Army Medical Corps (Medical).

240188 Captain F. N. Dwyer relinquishes the temporary rank of Major, 16th February, 1961, and is placed upon the Retired List (Eastern Command) and granted the military title of Captain with permission to wear the prescribed uniform, 17th February, 1961.

Citizen Military Forces.

Northern Command.

Royal Australian Army Medical Corps (Medical).—110316 Lieutenant-Colonel H. W. A. Forbes relinquishes command 2nd Casualty Clearing Station, 30th June, 1960. *To be Lieutenant, 1st January, 1961*—431906 Major (Temporary Lieutenant-Colonel) M. W. Elliott.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps (Medical).

Southern Command.—The resignation of Honorary Captain G. T. Schmidt of his commission is accepted, 23rd February, 1961.

The following officer is placed upon the Retired List (Western Command), and granted a military title equivalent to the substantive or honorary rank shown, with permission to wear the prescribed uniform, 30th April, 1961: Lieutenant-Colonel (Honorary Colonel) H. M. Trethowan, E.D.

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force.

Medical Branch.

Robert Maycock, A.F.C. (0310793) is appointed to a four-year short-service commission on probation for a period of twelve months, 10th January, 1961, with the rank of Wing Commander, and with seniority as from 10th July, 1959.

Royal Australasian College of Surgeons.

THE EDWARD LUMLEY SURGICAL RESEARCH FELLOWSHIP.

THE late Mr. Edward Lumley, during his lifetime, established a fund, the income from which is to be used to provide surgical research fellowships to medical graduates who, by their record, including publications, have displayed special aptitude for this type of work, but whose financial position is such that they cannot continue to pursue research projects without receiving financial assistance.

Applications are invited from medical graduates for a fellowship which may be up to the value of £2000 sterling for one year.

The fellowship shall be tenable in the United Kingdom, and the Council of the Royal Australasian College of Surgeons shall have full power to prescribe the conditions about the type of research work to be undertaken. Arrangements can be made on behalf of a successful Fellow for research work to be undertaken in the Departments of Anatomy, Pathology, Physiology, Pharmacology, Dental Science, Anæsthetics and Ophthalmology at the Royal College of Surgeons of England, or the work may be done elsewhere in the United Kingdom.

Applications should reach the Secretary of the Royal Australasian College of Surgeons on or before January 31, 1962. Applicants are required to submit (*a*) a statement of their financial position, (*b*) a statement of their qualifications for research work, (*c*) full details of the research projects which they desire to pursue.

Further information may be obtained from the Secretary, Royal Australasian College of Surgeons, Spring Street, Melbourne, C.1, Victoria.

ALAN NEWTON PRIZE.

IN 1951, the sum of £1042 was subscribed to provide a prize to recognize the services to the Royal Australasian College of Surgeons of Sir Hibbert Alan Stephen Newton, Kt., a Foundation Fellow and, later, a President of the College. This sum of money has been invested in authorized trustee investments and the interest used to provide a prize for essays on practical surgical subjects. The prize is to be written under the following conditions.

The Alan Newton Prize shall be awarded biennially.

Candidates for the prize shall be Fellows of the Royal Australasian College of Surgeons (not being members of the Council), the Royal College of Surgeons of England, the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland, Fellows in Surgery of the Royal Faculty of Physicians and Surgeons of Glasgow, or Fellows in Surgery of the College of Physicians, Surgeons and Gynæcologists of South Africa.

Essays must be typewritten in English and not exceed 75,000 words. Case histories of cited cases must not be included in the typescript, but placed after it in an appendix.

Each essay must be distinguished by a motto and accompanied by a sealed envelope containing the name and address

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED APRIL 1, 1961.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	3(2)	..	..	..	..	1(1)	..	..	4
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	1	..	..	..	..	..	2	..	3
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	1	..	..	..	..	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	1	..	1
Diarrhœa (Infantile)	2	9(5)	4(3)	..	2	..	4	..	21
Diphtheria	2	..	..	..	1	..	..	..	3
Dysentery (Bacillary)	..	..	1(1)	3(2)	1(1)	..	5	..	10
Encephalitis	..	..	..	..	..	..	..	..	..
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	83(38)	42(18)	12(6)	28(18)	4(2)	7	..	4	180
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	..	..	..	..	..
Leptospirosis	..	..	1	..	..	..	..	..	1
Malaria	..	..	..	..	..	..	2	..	2
Meningococcal Infection	..	2(2)	..	..	..	..	..	..	2
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	..	..	2	..	..	1	..	..	3
Puerperal Fever	4(2)	..	1	..	..	..	..	..	5
Rubella	..	9(3)	..	2(1)	5(3)	..	..	..	16
Salmonella Infection	..	..	..	..	3(3)	..	..	1	4
Scarlet Fever	1(1)	6(2)	2(2)	1(1)	..	1	..	..	11
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..
Trachoma	..	..	..	..	2(2)	..	1	..	3
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	16(11)	7(5)	17(5)	..	11(9)	3	..	2	56
Typhoid Fever	..	..	..	..	..	..	..	..	..
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

of the author and having on the outside of the envelope the motto corresponding to that on the essay.

Essays must reach the Secretary on or before December 1 in the appropriate year.

The prize essay and accompanying illustrations and preparations will become the property of the College.

Authors may claim essays not awarded prizes upon authenticated application within two years.

If no essay is adjudged worthy of the prize, no award shall be made.

Any unexpended interest may be added to the principal of the fund.

The subject for the next essay will be "The Importance, Incidence, and Control of Post-Operative Infection in Current Surgical Practice". All entries must be in the hands of the Secretary, Royal Australasian College of Surgeons, Spring Street, Melbourne, on or before December 1, 1962.

Notice.

PETHIDINE ADDICT.

A YEAR AGO (MED. J. AUST., March 12, 1960), at the request of the Medical Secretary of the Victorian Branch of the British Medical Association, we published the description of a pethidine addict then operating. We are informed that this notice subsequently led to his identification in Adelaide, and that he has recently reappeared in Melbourne and succeeded in obtaining pethidine for alleged renal colic. In view of this patient's interstate reputation and the evidence that he has now recommenced activities, we republish his description.

> This man has been operating mainly in the Melbourne area since 1955, but has imposed on practitioners and hospitals in Sydney, Hobart and Adelaide. He presents with a history of having had a right nephrectomy, and he very convincingly simulates an attack of left renal colic, sometimes even producing a specimen of artificially blood-stained urine.
>
> He is an intelligent, well-spoken man, aged 34, with a mild deformity of the nose resulting from an old fracture. He is 5 ft. 9 in. in height, and inclined to be heavily built. He has dark reddish-brown hair, brown eyes, and fair complexion with numerous freckles. He has five abdominal scars—(i) an incision in the right flank in the renal area, (ii) a McBurney's incision in the right iliac fossa, (iii) a left upper paramedian incision, (iv) an incision in the left flank in the renal area, (v) a transverse incision in the left iliac fossa.

Corrigendum.

OBITUARY: JOHN GERALD HAYDEN.

SIR ALBERT COATES informs us that there was a slight error in his contribution to the obituary of the late Professor J. G. Hayden. On page 574, in the sixth line of the sixth paragraph of the first column, "1942" should be "1948".

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Murray, Patrick John Stephens, B.Chir., 1957 (Univ. Cambridge), M.B., 1958 (Univ. Cambridge), M.R.C.S. England, L.R.C.P. London, 1957, Repatriation General Hospital, Concord.

Macindoe, Neil Arnold, M.B., B.S., 1961 (Univ. Sydney), Lismore Base Hospital, Lismore.

Nebenzahl, Ben, M.B., B.S., 1959 (Univ. Sydney), Canterbury District Memorial Hospital, Campsie.

Deaths.

THE following death has been announced:

LELEU.—Charles John Newhill LeLeu, on April 12, 1961, at Samoa.

Diary for the Month.

MAY 9.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
MAY 11.—New South Wales Branch, B.M.A.: Public Relations Committee.
MAY 15.—Victorian Branch, B.M.A.: Finance Sub-Committee.
MAY 16.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MAY 17.—Western Australian Branch, B.M.A.: General Meeting.
MAY 18.—New South Wales Branch, B.M.A.: Clinical Meeting.
MAY 19.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations, other than those normally used by the Journal, and not to underline either words or phrases.

Authors of papers are asked to state for inclusion in the title their principal qualifications as well as their relevant appointment and/or the unit, hospital or department from which the paper comes.

References to articles and books should be carefully checked. In a reference to an article in a journal the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of article. In a reference to a book the following information should be given: surname of author, initials of author, year of publication, full title of book, publisher, place of publication, page number (where relevant). The abbreviations used for the titles of journals are those of the list known as "World Medical Periodicals" (published by the World Medical Association). If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full data in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

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